State of Georgia
Department of Transportation
District 3

STP-164-1(39) and STP-164-1(48)

STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION

P. I. Nos. 322400 and 322405

Coweta County, Georgia

Value Engineering Report

Final Design Stage

March 2007

Design Team

Wolverton & Associates, Inc.

Value Engineering Consultant

Lewis & Zimmerman Associates, Inc.

Lewis & Zimmerman Associates, Inc.
Taking the Chance out of Change
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April 3, 2007

Ms. Lisa L. Myers
State of Georgia Department of Transportation, General Office
No. 2 Capitol Square, Room 266
Atlanta, Georgia 30334-1002

Re: Project Numbers STP-164-1(39), P. I. No. 322400 and STP-164-1(48), P. I. No. 322405,
State Route 34 Bypass Widening and Reconstruction in Coweta County, Georgia
Value Engineering Study Report

Dear Ms. Myers:

Lewis & Zimmerman Associates, Inc. is pleased to submit four hard copies and one CD ROM of the referenced report.

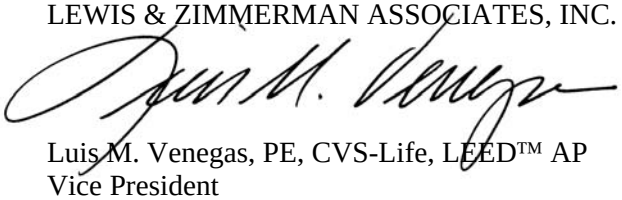
The project is the widening and reconstruction of an urban principal arterial, which offers areas of opportunity for functional evaluation. This is particularly true with regard to right-of-way requirements, realignment of the mainline, and construction cost. In addition, due to the Department's heightened awareness of the lack of funds to construct the State's entire highway program, the Department has begun to take a more serious role of implementing value engineering ideas that are not only feasible but help reduce the cost of the instant project in order to afford other projects.

As such, the objective of the VE effort was to identify opportunities that would improve the value of the project in terms of fulfilling the basic functions of alleviating congestion while improving safety, increasing capacity and, where logically possible and warranted, reducing capital cost.

We thank you for your hospitality, the use of your office space, and for providing the information necessary for the VE team to generate creative, alternative solutions for this project. We are available to answer any questions you may have as you review this report and determine an implementation strategy.

Sincerely yours,

LEWIS & ZIMMERMAN ASSOCIATES, INC.



Luis M. Venegas, PE, CVS-Life, LEED™ AP
Vice President

Attachment

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EXECUTIVE SUMMARY

INTRODUCTION

This report summarizes the results of the value engineering (VE) study conducted by Lewis & Zimmerman Associates, Inc. (LZA) for the State of Georgia Department of Transportation (GDOT), Atlanta, Georgia. The subjects of the study were the following projects: State Route (SR) 34 Bypass Widening and Reconstruction known as STP-164-1(39), P. I. No. 322400 and STP-164-1(48), P. I. No. 322405 in Coweta County, Georgia, being designed by Wolverton & Associates, Inc.

PROJECT DESCRIPTION

This project is the widening and reconstruction of the SR 34 Bypass [bypassing the City Newnan] from SR16/US 29 Alternate/Reverend Travis Henry Edison Highway to SR 34/Bullsboro Road for a total of 4.03 miles. The project proposes to widen and reconstruct the existing two-lane urban connecting link to a four-lane urban principal arterial with a 20 ft. to 24 ft. raised median and urban shoulders widening to a 28 ft. median width at crossroad intersections to accommodate a similar median crossover. From County Road (CR) 70/Hospital Road to SR 16, the raised median and urban shoulders will transition to match the existing SR 34 Bypass lanes and rural shoulders at SR 16. The raised median from SR 16 to SR 34 will be 20 ft. to 24 ft. and transition to 28 ft. at intersections.

The combined probable cost of construction for both projects is $49,096,573, broken down as follows:

	STP-164-1(39) P. I. No. 3224400	STP-164-1(48) P. I. No. 3224405
Construction Subtotal	$20,944,480	$3,417,927
Engineering and Construction	2,094,480	341,793
Inflation	5,983,210	976,339
Total Construction	29,022,138	4,736,119
Right of Way	9,530,768	5,807,548
TOTAL	$38,552,906	$10,543,667

CONCERNS AND OBJECTIVES

The project is the widening and reconstruction of an urban principal arterial, which offers areas of opportunity for functional evaluation. This is particularly true with regard to right-of-way requirements, realignment of the mainline, and construction cost.

The Department faces the lack of funds to construct the State's entire highway program and is seriously considering implementing value engineering ideas that are not only feasible but also help in reducing the cost of the instant project in order to afford other projects.

As such, the objective of the VE effort was to identify opportunities that would alleviate congestion, improve safety, increase capacity, and, where logically possible and warranted, reduce capital cost.

HIGHLIGHTS OF THE STUDY

Listed below are some of the developed ideas.

The intersection of Hospital Road and SR 34 Bypass is being reconfigured to be perpendicular and at the correct distance downstream from the SR 70/Roscoe Road and SR 34 Bypass intersection. Hospital Road must be shifted to the west, requiring the purchase of almost 1.5 acres of right-of-way, impacting wetlands and extending a double 8 ft. x 8 ft. concrete box culvert. In addition, a new traffic signal is to be provided at the relocated intersection. Alt. No. 8 would retain the existing alignment of Hospital Road without the necessary right-of-way and wetlands impact, and would provide the traffic signal. Although this alternative retains the intersection's skew angle and maintains its closeness to the SR 70/Roscoe Road intersection, the significant cost savings of nearly $1,800,000 warrants a second look; even if an exemption is needed for the distance between the two intersections - a situation that has not been a problem since the bypass was originally constructed.

The use of 11 ft. travel lanes, usually not the Department's desirable or recommended width, can be used successfully when warranted. Therefore, Alt. No. 36 promotes the use of 11 ft. lanes in lieu of the as-designed 12 ft. lanes, and denotes initial savings of about $1,760,000. Of this amount, nearly $600,000 is in right-of-way cost avoidances.

The project calls for the use of a 4 ft. bicycle lane on each side of the road in the curb-and-gutter section between the travel lanes and the gutter. Although a bicycle lane for this route is included in the Coweta County bicycle plan, there are no plans to construct any bicycle facilities on either end of this project, nor is this route on the State's Transportation Improvement Program (TIP)/Regional Transportation Plan (RTP). Hence, Alt. No. 11 eliminates the bicycle lane and places the gutter adjacent to the travel lane. As noted on the alternative, initial savings approaching $1,120,000 is possible.

Acknowledging the rationale for the Department's desire to have full-depth shoulders, this widening and reconstruction of SR 34 Bypass is, in fact, its future expansion negating the need for a travel lane for further future expansions. Therefore, Alt. No. 37 eliminates the full-depth shoulders and provides for 6 in. thick asphalt shoulders on top of the existing compacted material. It is noted that minor repairs and short duration detours can be accommodated on the reduced thickness shoulders, all while saving close to $535,000.

Finally, in an attempt to avoid/minimize impacts to a currently designated environmentally sensitive area, the mainline alignment is being shifted to the south near the Coweta-Fayette Electrical property. Since the wetlands area under consideration is quite small, Alt. No. 28 would follow the existing alignment as the rest of the project and provide a longer/taller retaining wall when approaching the potentially sensitive environmental area. Initial savings of close to $500,000 is possible.

The Summary of Potential Cost Savings worksheet follows this narrative outlining all of the alternatives and design suggestions developed by the VE team. Some of the alternatives are mutually exclusive or interrelated, so that addition of all project cost savings does not equal total savings for the project. A full listing of all of the ideas considered by the VE team can be found on the Creative Idea Listing worksheets in Section 4 of this report.

SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

			PRESENT WORTH OF COST SAVINGS			
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
5	Use grass and landscaping on median	$ 899,361	$ 383,492	$ 515,869		$ 515,869
6	Use a five-lane typical section	$ 3,485,424	$ 1,384,401	$ 2,101,023		$ 2,101,023
7	Eliminate asphalt curb behind guardrail and associated drainage	$ 30,509	$ -	$ 30,509		$ 30,509
8	Retain the current Hospital Road/SR 34 Bypass intersection alignment	$ 1,813,856	$ -	$ 1,813,856		$ 1,813,856
10	Selectively minimize the amount of sidewalks and associated work	$ 1,414,865	$ 1,349,913	$ 64,952		$ 64,952
11	Eliminate the bicycle lane	$ 1,120,170	$ -	$ 1,120,170		$ 1,120,170
15	Improve the Jefferson Parkway Elementary School entrance	$ -	$ 33,957	$ (33,957)		$ (33,957)
17	Use modular block mechanically stabilized embankment at Wall No. 2 in lieu of cast-in-place cantilever wall	$ 248,673	$ 146,588	$ 102,085		$ 102,085
21	Reduce the length of left turn lanes throughout the project	$ 573,031	$ 236,905	$ 336,126		$ 336,126
23	Cul-de-sac Lullwater Circle	$ 136,382	$ 21,454	$ 114,928		$ 114,928
24	Do not excavate at the bridge over the CSX Railroad	$ 20,505	$ -	$ 20,505		$ 20,505
25	Eliminate the southern driveway at Milano's Restaurant	Design Suggestion				
26	Eliminate the curb cut at Milano's Restaurant on SR 34 Bypass	Design Suggestion				
27	Do not improve the drive into Wahoo Creek Water Pollution Control Plant	$ 20,432	$ -	$ 20,432		$ 20,432
28	Do not deviate from original alignment at Coweta-Fayette Electrical	$ 1,009,855	$ 497,447	$ 512,408		$ 512,408
29	Improve Cross Brook Drive and Harpers Farm Drive intersections with SR 34 Bypass	Design Suggestion				
30	Retain Ronny D. Jones Enterprises driveway in its current location and improve as appropriate	Design Suggestion				
32	Remove excess width at right turns from US 29 into SR 34 Bypass	$ 33,212	$ -	$ 33,212		$ 33,212
33	Minimize the number of access points to the Phillips 66 gas station at SR 70/Roscoe Road and SR 34 Bypass	Design Suggestion				
36	Use 11-foot wide travel lanes in lieu of 12-foot lanes	Design Suggestion				
37	Use 6-inch thick shoulders instead of full depth shoulders	$ 1,513,758	$ 978,467	$ 535,291		$ 535,291
38	Remove taper from the bridge over the CSX Railroad	Design Suggestion				
39	Remove the eastbound "U" turn lane at Hospital Road	Design Suggestion				

STUDY RESULTS

INTRODUCTION

The results are the major feature of a value engineering study since they represent the benefits that can be realized on the project by the owner, users and designer. The results will directly affect the project design and will require coordination among the designer, the user and the owner to determine the ultimate acceptance of each alternative.

The creative ideas are organized according to the order in which they were originally generated by the VE team during the Function Analysis and Creative phases of the VE workshop.

RESULTS OF THE STUDY

The VE team generated 39 ideas for change during the Function Analysis and Creative phases of the workshop. The evaluation of these ideas was based upon their potential for capital cost savings, probability of acceptance, availability of information to properly develop an idea, compliance with perceived quality, adherence to universally accepted standards and procedures, life cycle cost efficiency, safety, maintainability, constructibility and soundness of the idea.

Of the 39 ideas generated, 25 were sufficiently rated to warrant further investigation. Continued research and development of these ideas yielded 17 alternatives for change with an impact on project costs, and six design suggestions. These alternatives and design suggestions are presented in detail following this narrative and on the Summary of Potential Cost Savings worksheets.

EVALUATION OF ALTERNATIVES

It is important to consider each part of an individual alternative on its own merit. There may be a tendency to disregard an alternative because of concern about one portion of it. Separate consideration should be given to each of the areas within an alternative that are acceptable, and those parts should be considered in the final design, even if the entire alternative is not implemented.

Cost is the primary basis of comparison for alternative designs. To ensure that costs were comparable within the alternatives proposed by the VE team, the designer's cost estimates, where possible, were used as the pricing basis. Where appropriate, the impact of energy costs, replacement costs, and effect on operations and maintenance are shown within each alternative.

Some of the alternatives are interrelated, so acceptance of one may preclude the acceptance of another. The reader should evaluate those alternatives carefully to select the ideas with the greatest beneficial impact to the project.

SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

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10	Selectively minimize the amount of sidewalks and associated work	$ 1,414,865	$ 1,349,913	$ 64,952		$ 64,952
11	Eliminate the bicycle lane	$ 1,120,170	$ -	$ 1,120,170		$ 1,120,170
15	Improve the Jefferson Parkway Elementary School entrance	$ -	$ 33,957	$ (33,957)		$ (33,957)
17	Use modular block mechanically stabilized embankment at Wall No. 2 in lieu of cast-in-place cantilever wall	$ 248,673	$ 146,588	$ 102,085		$ 102,085
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24	Do not excavate at the bridge over the CSX Railroad	$ 20,505	$ -	$ 20,505		$ 20,505
25	Eliminate the southern driveway at Milano's Restaurant	Design Suggestion				
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VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **5**

DESCRIPTION: **USE GRASS AND LANDSCAPING ON THE MEDIAN**

SHEET NO.: **1 of 2**

ORIGINAL DESIGN:

The current design indicates a four-lane typical section with a 22 ft. raised concrete median throughout the project.

ALTERNATIVE:

Using the four-lane typical section, change the concrete median to one that will permit the use of grass and landscaping.

ADVANTAGES:

- Initial cost reduction
- Simplifies construction
- Acceptable standard
- Improves aesthetics
- "Green" environment

DISADVANTAGES:

- Requires periodic maintenance of the grassed/ landscaped median

DISCUSSION:

Grass/landscaped raised medians are generally better received by the public than providing concrete filled medians. Although they create additional maintenance, the improved roadway aesthetics and environmentally friendlier solution will outweigh that disadvantage and place the Department in a better light with the public.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 899,361	—	$ 899,361
ALTERNATIVE	$ 383,492	—	$ 383,492
SAVINGS	$ 515,869	—	$ 515,869

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **5**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Concrete Median	SY	20,500	31.66	649,030			
Grassed / Landscaped Median	SY				20,500	13.50	276,750
	Sub-total			649,030			276,750
Mark-up at	**38.57%**			250,331			106,742
	TOTAL			899,361			383,492

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **6**

DESCRIPTION: **USE A FIVE-LANE TYPICAL SECTION**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (Sketch attached)

The current design indicates a four-lane typical section with a 22 ft. raised concrete median throughout the project.

ALTERNATIVE: (Sketch attached)

Use a five-lane typical section with no median. The center lane shall be a continuous left turn lane.

ADVANTAGES:

- Reduces initial cost
- Simplifies construction
- Acceptable standard
- Reduces access limitation
- Reduces drainage and inlets

DISADVANTAGES:

- Eliminates the median and curb therefore no fixed safety
- No channelized traffic to specific intersections (no limited access)
- Volume of traffic may preclude this solution

DISCUSSION:

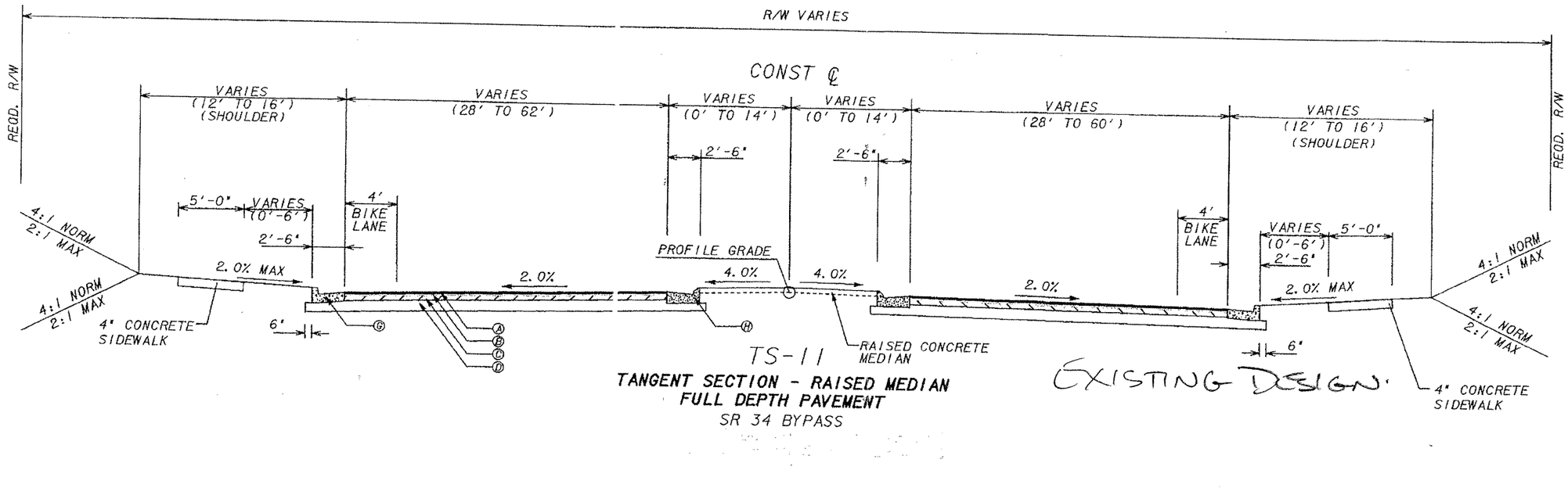
Although the 45 mph design speed not does preclude the use of a five-lane section, traffic volume may negate this solution. However, this solution could be used at specific sections within the four-mile corridor, and one is commonly done in many cities and towns.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 3,485,424**	**—**	**$ 3,485,424**
ALTERNATIVE	**$ 1,384,401**	**—**	**$ 1,384,401**
SAVINGS	**$ 2,101,023**	**—**	**$ 2,101,023**

EXAMPLE

ALT 6

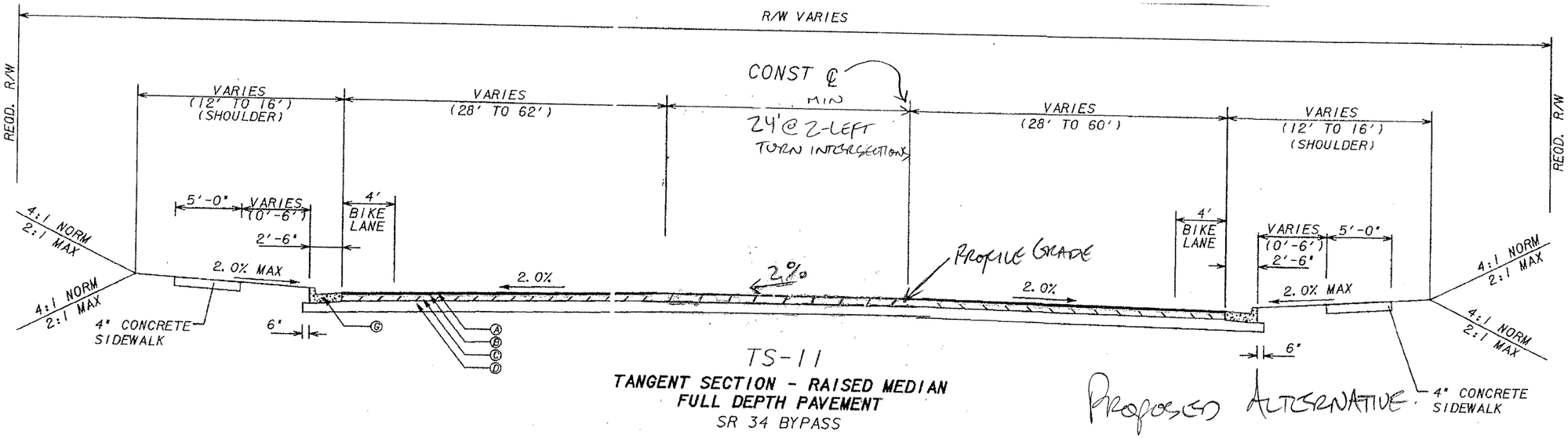
#2 OF 4



TS-11

TANGENT SECTION - RAISED MEDIAN
FULL DEPTH PAVEMENT
SR 34 BYPASS

EXISTING DESIGN



TS-11

TANGENT SECTION - RAISED MEDIAN
FULL DEPTH PAVEMENT
SR 34 BYPASS

PROPOSED ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 6

SHEET NO.: 3 of 4

ASPHALT PAVEMENT : 14' LANE.

$\frac{14'}{22'}$ (20500 SY) = 13,046 SY

//

CURB & GUTTER. : TYPE 7 CURB (30")

AU = 32,800 FT @ $15.88

//

CUT & BORROW :- 8' REDUCTION ≈ 8% OF WIDTH

CUT = (121771)(0.08) = 9742 CY

BORROW = (317927)(0.08) = 25,435 CY

//

R/W : 8' REDUCTION OF ROADWAY ≈ 8% OF WIDTH.

∴ $9,530,800 (0.08) = $762,464

∴ $5,807,550 (0.08) = $464,604

No Mark-up's

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **6**

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
Full Depth Pavement	SY				13,046	76.58	999,063
Excavation	CY	9,742	7.25	70,630			
Median Concrete	CY	20,500	31.66	649,030			
Curb and Gutter Type 7	LF	32,800	15.88	520,864			
Borrow	CY	25,435	6.07	154,390			
Catch Basins	EA	55	1,973.47	108,541			
Outlet - Flared End	EA	5	695.86	3,479			
Riprap	SY	30	44.81	1,344			
18" RCP at 10 feet	LF	4,365	38.76	169,187			
Construction Subtotal				1,677,466			999,063
Construction Markup at 38.57%				646,999			385,338
Construction Total				2,324,464			1,384,401
Right-of-Way from STP-164-1(39) of $9,530,800 (use 8% Reduction)				762,464			
Right-of-Way from STP-164-1(48) of $5,870,550 (use 8% Reduction)				469,644			
ROW Subtotal				1,160,960			
ROW Markup at 247.20%				INCL			
ROW Total				1,160,960			
Sub-total				3,485,424			1,384,401
Mark-up at				INCL			INCL
TOTAL				3,485,424			1,384,401

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **7**

DESCRIPTION: **ELIMINATE THE ASPHALT CURB BEHIND THE GUARDRAIL AND ASSOCIATED DRAINAGE**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (Sketch attached)

The current design indicates an asphalt curb is to be constructed behind the guardrail at various locations in the rural typical section.

ALTERNATIVE: (Sketch attached)

Omit the asphalt curb and associated spillways.

ADVANTAGES:

- Initial cost reduction
- Simplifies construction

DISADVANTAGES:

- Potential erosion behind the guard rail beyond the pavement

DISCUSSION:

There is no obvious reason for this curb to be constructed. The curb is always set behind the guardrail in the rural section, but there are many runs of guardrail that have no curb. Also, there are several spillways that are labeled as Type 2, but are drawn as Type 1 (Station 130+00 Rt. and Station 135+00 Rt., for example). Also, there are no Type 2 spillways shown in the cost estimate.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 30,509	—	$ 30,509
ALTERNATIVE	$ 0	—	$ 0
SAVINGS	$ 30,509	—	$ 30,509

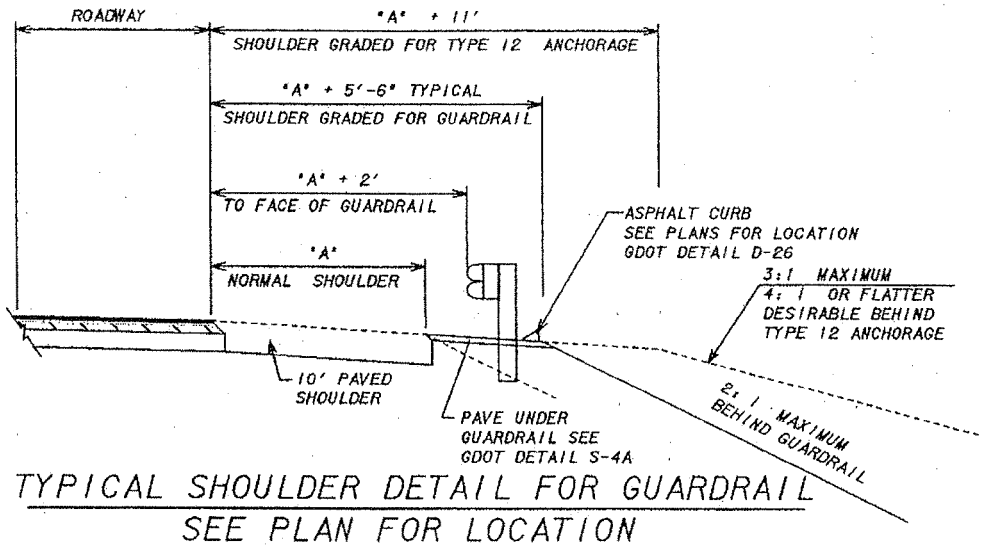
SKETCHES

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 7

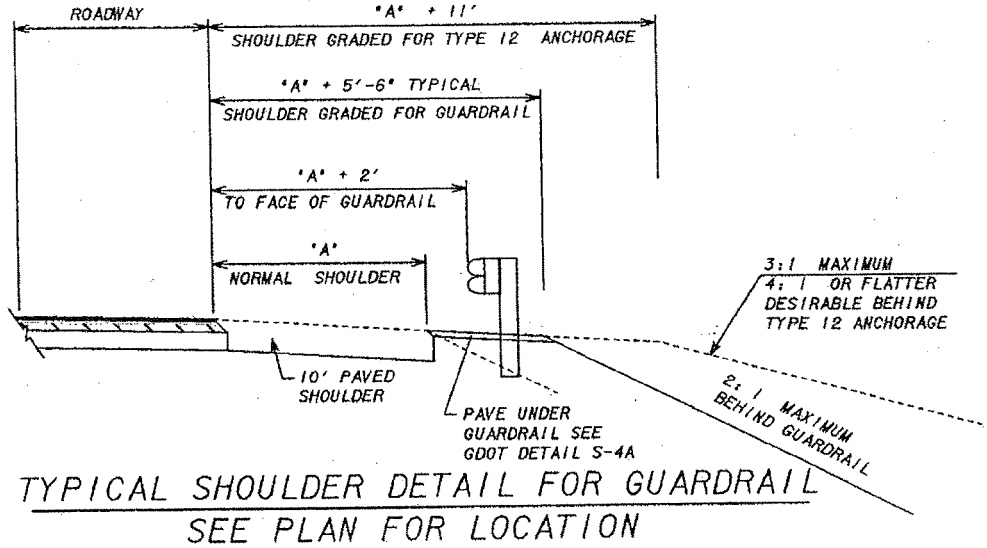
SHEET NO.: 2 of 4

☒ AS DESIGNED



TYPICAL SHOULDER DETAIL FOR GUARDRAIL
SEE PLAN FOR LOCATION

☒ ALTERNATIVE



TYPICAL SHOULDER DETAIL FOR GUARDRAIL
SEE PLAN FOR LOCATION

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **7**

SHEET NO.: **3 of 4**

Area of asphalt curb = 0.5(8/12)(5/12) = 0.14 ft^2 per foot = 0.14(100) = 14 ft^2 per 100 feet

Weight = 145(14)/2000 = 1.015 ton/100 feet

Asphalt curb locations:

1) 124+13 to 135+00 Right L = 1087'; 2 Type 1 spillways
2) 126+50 to 135+44 Left L = 895'; 3 Type 1 spillways
3) 183+50 to 187+50 Left L = 400'; 3 Type 2 spillways
4) 199+50 to 202+50 Right L = 300'; 1 Type 2 spillway
5) 200+00 to 205+00 Left L = 500'; 1 Type 1 spillway, 1 Type 2 spillway

Total length = 3182'
Total asphalt weight = 1.015(3182)/100 = 32.3 tons

Total spillways: 6 Type 1 spillways
5 Type 2 spillways

Costs: Use $100/ton for asphalt
$1,743.69 per Type 1 spillway
There are no Type 2 spillways in the project estimates. In the GDOT Mean Item Summary, Type 2 spillways cost 95.5% of the cost of Type 1 spillways, so use 0.955(1743.69) = $1665 for each Type 2 spillway.

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **7**

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
Asphalt	TN	32.30	100.00	3,230			
Type 1 Spillway	EA	6	1,743.69	10,462			
Type 2 Spillway	EA	5	1,665.00	8,325			
Sub-total				22,017			
Mark-up at	**38.57%**			8,492			
TOTAL				30,509			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **8**

DESCRIPTION: **RETAIN THE CURRENT HOSPITAL ROAD / SR 34 BYPASS INTERSECTION ALIGNMENT**

SHEET NO.: **1 of 6**

ORIGINAL DESIGN: (Sketch Attached)

The current design realigns Hospital Road to the west to intersect SR 34 Bypass perpendicularly.

ALTERNATIVE: (Sketch Attached)

Leave Hospital Road in its current location and install the proposed traffic signal.

ADVANTAGES:

- Avoids the wetlands
- Eliminates right-of-way take
- Eliminates 165 feet of concrete box culvert
- Reduces initial cost
- Simplifies design and construction

DISADVANTAGES:

- Hospital Road retains a skewed intersection with SR 4 Bypass

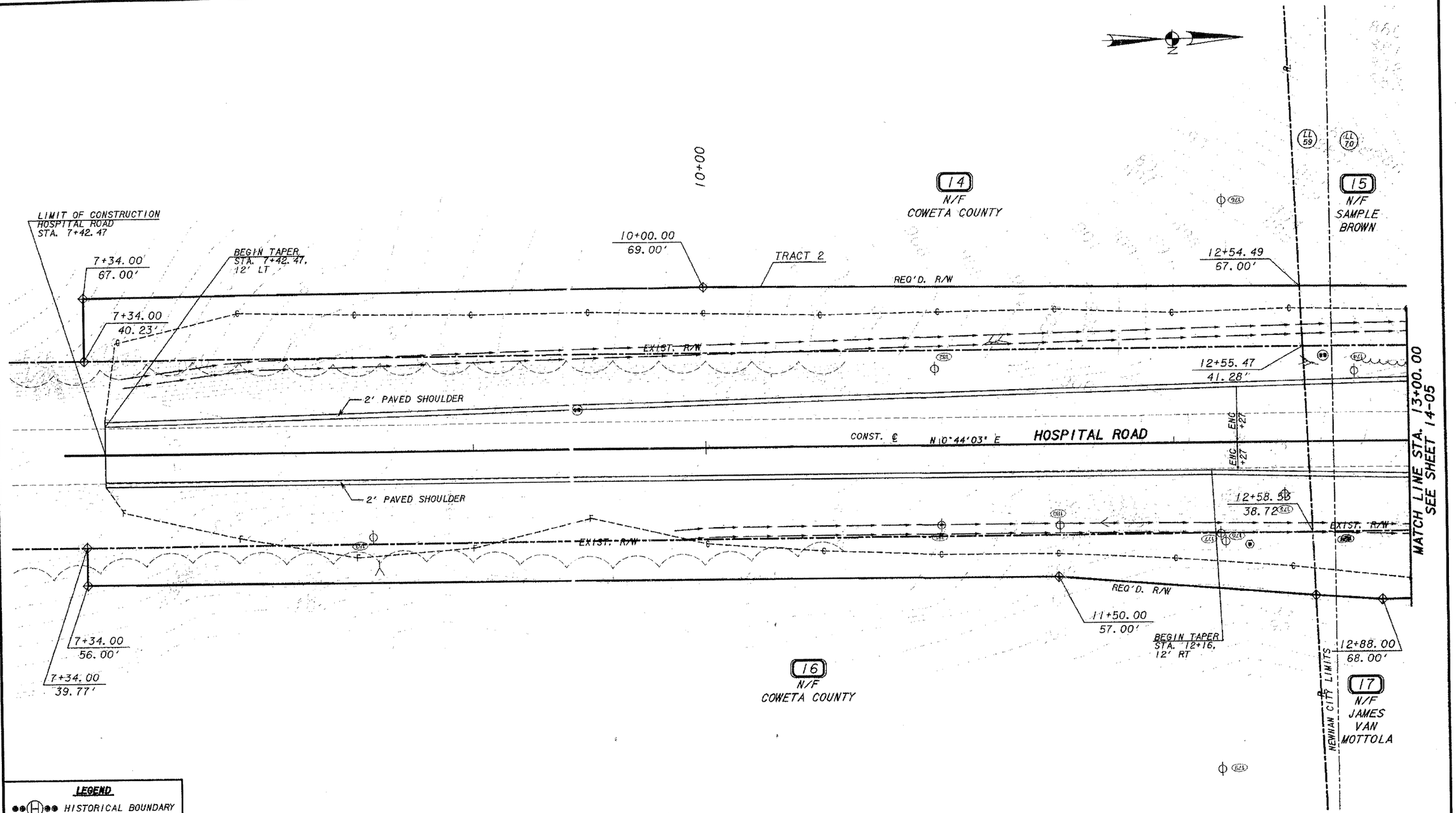
DISCUSSION:

This alternative precludes impacts to the west side of Hospital Road and eliminates the necessary right-of-way takes to accommodate the proposed relocated road.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 1,813,856**	**—**	**$ 1,813,856**
ALTERNATIVE	**$ 0**	**—**	**$ 0**
SAVINGS	**$ 1,813,856**	**—**	**$ 1,813,856**

SHEET 2 OF 6

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
COWETA	STP-164-1(39) & STP-164-1(48)		



LEGEND

- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

PROPERTY AND EXISTING R/W LINE	—℄—
REQUIRED R/W LINE	
CONSTRUCTION LIMITS	—C— —F—
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES	
EASEMENT FOR CONSTR OF SLOPES	
EASEMENT FOR CONSTR OF DRIVES	

BEGIN LIMIT OF ACCESS	BLA
END LIMIT OF ACCESS	ELA
LIMIT OF ACCESS	
R/W AND LIMIT OF ACCESS	

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES		

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

CROSSROAD PLAN
HOSPITAL ROAD

DRAWING No. 14-04

Curve Data
N - KC19
Δ - 11°48'07" (LT)
T - 153.07
L - 305.06
E - 7.89
R - 1481.00
PI STA - 16+49.45
PI X - 2099242.713
PI Y - 1236569.244

15+00

15 N/F SAMPLE BROWN

15+98.00 / 111.00'

16+55.00 / 150.00'

16+53.50 / 110.00'

17+23.50 / 151.00'

192 SY STONE DUMPED RIPRAP TYPE 1, 24"

17+63.00 / 102.50'

REQ'D. R/W

H-1

PC 14+96.38

PT 18+81.44

13+79.00 / 66.00'

STA. 14+44 TYPE 1 ANCHOR END W-BEAM GR.

END TAPER STA. 14+81, 30' LT

REQ'D. R/W

2' PAVED SHOULDER

2' PAVED SHOULDER

2' PAVED SHOULDER

16.5' DOUBLE BOX CULVERT 8'x8'

3:1

20'

2' PAVED SHOULDER

MATCH LINE STA. 13+00.00 SEE SHEET 14-04

13+62.37 / 41.49'

N 0°44'03" E

HOSPITAL ROAD

CONST. ℄

KC19

BFSE +87

BFSE +26

NC +38

NC +49

FLAT +38

+68

RC +49

30" PIPE

EXIST. R/W

END SPECIAL DITCH RT STA. 17+68

H-2

MATCH LINE STA. 18+50.00 SEE SHEET 13-09

2' PAVED SHOULDER

2' PAVED SHOULDER

13+62.53 / 38.51'

18" SDP

BEGIN SPECIAL DITCH RT STA. 15+00

18+29.54 / 131.25'

REQ'D. R/W

EXIST. R/W

15+68.00 / 64.75'

STA. 16+00 TYPE 12 ANCHOR BEGIN W-BEAM GR.

14" SY STONE DUMPED RIPRAP TYPE 3, 24'

13+51.00 / 66.88'

13+87.00 / 66.23'

END TAPER STA. 14+54, 18' RT

END OVERLAY, LEVELING & FULL DEPTH WIDENING BEG N FULL DEPTH PAVEMENT STA 14+50.00

13+51.00 / 74.00'

13+87.00 / 74.00'

17 N/F JAMES VAN MOTTOLA

STA. 16+50, 42' RT BEGIN 4' CONC. DITCH PAVING CONSTRUCTION DETAIL D-10 DEPTH OF PROTECTION = 1.5'

REMOVE ROADWAY GRADE TO DRAIN AND GRASS

STA. 17+68, 69' RT BEGIN 4' CONC. DITCH PAVING CONSTRUCTION DETAIL D-10 DEPTH OF PROTECTION = 1.5'

LEGEND
- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS..... BLA
END LIMIT OF ACCESS..... ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

CROSSROAD PLAN HOSPITAL ROAD

DRAWING No. 14-05

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 8

SHEET NO.: 4 of 6

BEGINS STA 7+42
ENDS STA 18+50 ⇒ 1108 L.F.

PAVEMENT

- STA 7+42 TO STA 14+50 ⇒ 708 LF

TS-1S SECTION

4 FT SHOULDER + 24 FT LANE + 12 FT VARIED LANE = 40 FT

708 x 40 = 28320 SF
= 3147 SY

- STA 14+50 TO 18+50 ⇒ 400 LF

TS-1T SECTION

4 FT SHOULDER + 28 FT LANE + 14 FT VARIED LANE = 46 FT

400 x 46 = 18400 SF
= 2044 SY

3147 + 2044 = 5191 SY

5191 SY x $76.59/SY = $397,527

R/W

- 100 FT x 500 FT + 50 x 300 = 65,000 SF

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 8

SHEET NO.: 5 of 6

DOUBLE 8x8 BOX CULVERT

CONCRETE
2.498 CY/LF x $541.65 = $1353.04/FT

STEEL 268.4 #/FT x 0.89 = $238.88/FT

1591.92/FT

165 FT OF CULVERT

1591.92 x 165 = 262,666.80

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **8**

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
Full Depth Pavement	SY	5,191	76.58	397,527			
Excavation	CY	3,000	7.25	21,750			
Drainage	LF	165	1,592	262,680			
Construction Subtotal				681,957			
Construction Markup at 38.57%				263,031			
Construction Total				944,988			
Right-of-Way	SF	65,000	3.85	250,250			
ROW Subtotal				250,250			
ROW Markup at 247.20%				618,618			
ROW Total				868,868			
Sub-total				1,813,856			
Mark-up at				INCL			
TOTAL				1,813,856			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **10**

DESCRIPTION: **SELECTIVELY MINIMIZE THE AMOUNT OF SIDEWALK AND ASSOCIATED WORK**

SHEET NO.: **1 of 3**

ORIGINAL DESIGN:

The current design indicates the sidewalk begins at Station 214+00 on the right, and at Jackson Street (US 29) on the left, and continues to the end of the project at SR 34.

ALTERNATIVE:

Selectively omit sidewalks where it appears there will be very little usage.

ADVANTAGES:

- Initial cost reduction
- Less drainage to maintain
- Minimal savings on right-of-way
- Not needed
- Simplifies design and construction

DISADVANTAGES:

- May be necessary to add sidewalks in the future if pedestrian traffic develops
- Loss of amenity

DISCUSSION:

There are few residences along much of the portion of the project that have sidewalks, so there will be little usage of the sidewalks. In areas where there are residences, the sidewalks will be kept. From the railroad bridge east to SR 34, there are residences along the side streets and businesses along the Bypass that warrant having sidewalks. Eliminating the associated curb and gutter and drainage provides considerable savings both in construction costs and long-term maintenance. If a typical rural shoulder (not full depth) section was used, the savings would be considerably more.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 1,414,865**	**—**	**$ 1,414,865**
ALTERNATIVE	**$ 1,349,913**	**—**	**$ 1,349,913**
SAVINGS	**$ 64,952**	**—**	**$ 64,952**

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **10**

SHEET NO.: **2 of 3**

Eliminate sidewalk as follows:
On SR 34 Bypass:
From Station 214+00 to Cross Brook Drive (Station 231+25) on the right
From Harpers Farm Road (Station 235+46) to the Jefferson Parkway School (Station 289+80) on the right
From Jackson Street (Station 221+05) to Lullwater Circle (Station 296+10) on the left
On US 29:
From 15+85 to 19+25 left
From 20+75 to 27+00 left
From 11+20 to 19+25 right
From 20+75 to 31+50 right
On Hillwood Circle East:
From 18+20 to 19+25 left

Total length of sidewalk removed is 1725 + 5434 + 7505 + 340 + 625 + 805 + 1075 + 105 = 17614'
Area of sidewalk removed is 5(17614)/9 = 9786 SY
Total length of curb-and-gutter removed is also 17614 LF

Drainage components eliminated:
Catch basin Q-2, Flared end Sect. Q-1 (18"), 40' 18" RCP
Catch basins R-5, R-4, R-4.1, R-4.2, 230' 18" SDP
Catch basins Z-3, Z-4, Drop inlet Z-2, Flared end section Z-1 (18"), 420' 18" SDP
Catch basins AA-5.4, AA-5.3, AA-5.2, AA-5.1, AA-5, 990' 18" SDP
Catch basins BB-9, BB-8, BB-7, BB-6, BB-5, BB-3, BB-3A, BB-3B, BB-3C, BB-3D, BB-3E, BB-3F, BB-8.2, BB-8.1, Drop Inlet BB-7.1, (245 + 15 + 1280) 18" SDP, (440 + 100) 24" SDP, 170 30" SDP
Catch basins V-4.1, V-4, 90' 18" SDP
Catch basins W-2.2, W-2.1, 270' 18" SDP
Catch basins X-2.2, X-2.1, X-2, X-2A, 120' 18" SDP
Catch basins Y-2, Y-2.1, Y-2.2, Y-2.3, 85' 18" SDP
Catch basins AA-4.5, AA-4.4, AA-4.3, AA-4.2, 260' 18" SDP
Catch basins BB-3.1D, BB-3.1E, BB-3.1F, BB-3.1H, BB-1I, BB-3.1J, BB-3.1K, 425' 30" SDP; 155' 24" SDP, 465' 18" SDP
Catch basins DD-2, DD-2.1, DD-2.1A, 50' 18" SDP
Catch basins V-2.5, Drop Inlets V- 2.4, V-2.6, Flared end section Y-2.5A (18"), 125' 18" SDP, 55' 24" SDP
Catch basins V-2.3B, V-2.3A, V-2.3, 150' 18" SDP
Catch basins T-2, 230' 18" SDP

Total

Catch basins: 57	Flared end section, 18": 3	Drop Inlet: 4
18" SDP: 5065'	24" SDP: 750'	30" SDP: 595'

Alternative:
Additional pavement = 17614(6.5)/9 = 12,721 SY

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **10**

SHEET NO.: **3 of 3**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Sidewalk	SY	9,786	33.96	332,333			
Curb-and-Gutter	LF	17,614	16.40	288,870			
Catch Basin	EA	57	1,973.47	112,488			
Flared end Section (18")	EA	3	695.86	2,088			
Drop Inlet	EA	4	3,528.70	14,115			
18" Storm Drain Pipe	LF	5,065	38.76	196,319			
24" Storm Drain Pipe	LF	750	50.15	37,613			
30" Storm Drain Pipe	LF	595	62.56	37,223			
Pavement	SY				12,721	76.58	974,174
	Sub-total			1,021,047			974,174
Mark-up at	**38.57%**			393,818			375,739
	TOTAL			1,414,865			1,349,913

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **11**

DESCRIPTION: **ELIMINATE THE BICYCLE LANE**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (Sketch attached)

The current design calls for the use of a 4 ft. bicycle lane on each side of the road in the curb-and-gutter section between the travel lanes and the gutter.

ALTERNATIVE: (Sketch attached)

Eliminate the bicycle lane and place the gutter adjacent to the travel lane.

ADVANTAGES:

- Initial cost savings
- Less pavement to maintain
- Bicycle path for this section of SR 34 Bypass is not on the TIP/RTP
- Improves vehicular safety

DISADVANTAGES:

- Discourages bicycle travel
- Not in keeping with the Coweta County plan
- Loss of amenity
- Reduces bicyclists safety

DISCUSSION:

While this route is included in the Coweta County bicycle plan, there are no plans to construct bicycle facilities on either end of this project. In addition, this route is not part of the state bicycle plan. On the rural section of this project (west of US 29), the cyclists can ride on the shoulder. On the eastern end, they would have to ride in the travel lanes.

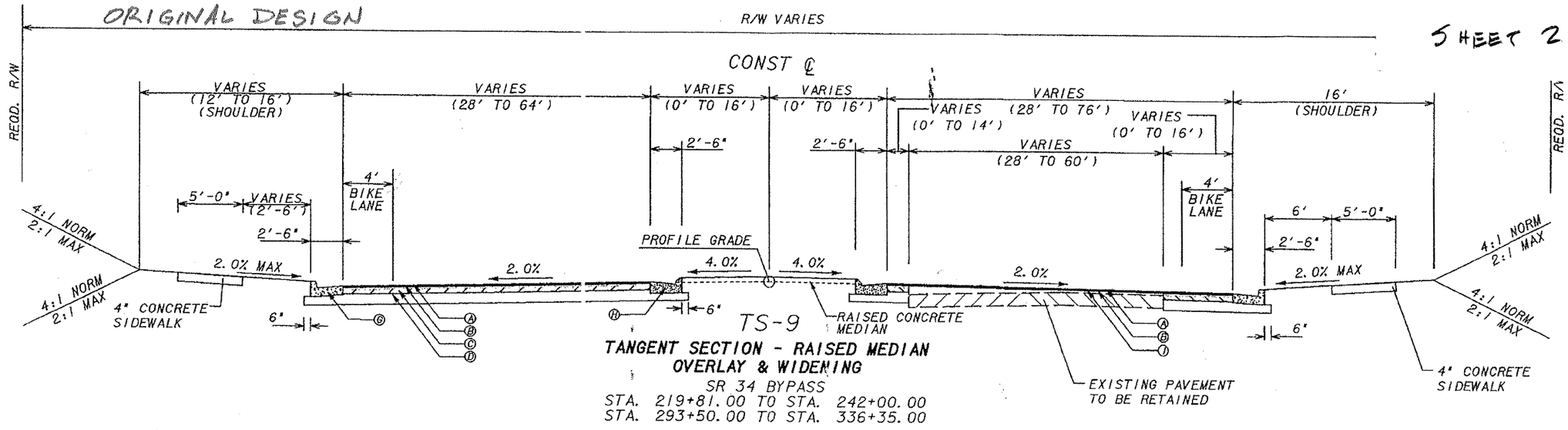
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 1,120,170	—	$ 1,120,170
ALTERNATIVE	$ 0	—	$ 0
SAVINGS	$ 1,120,170	—	$ 1,120,170

ALTERNATIVE NO. 11

SHEET 2 OF 4

COUNTY	PROJECT
COWETA	STP-164-1(39)

ORIGINAL DESIGN

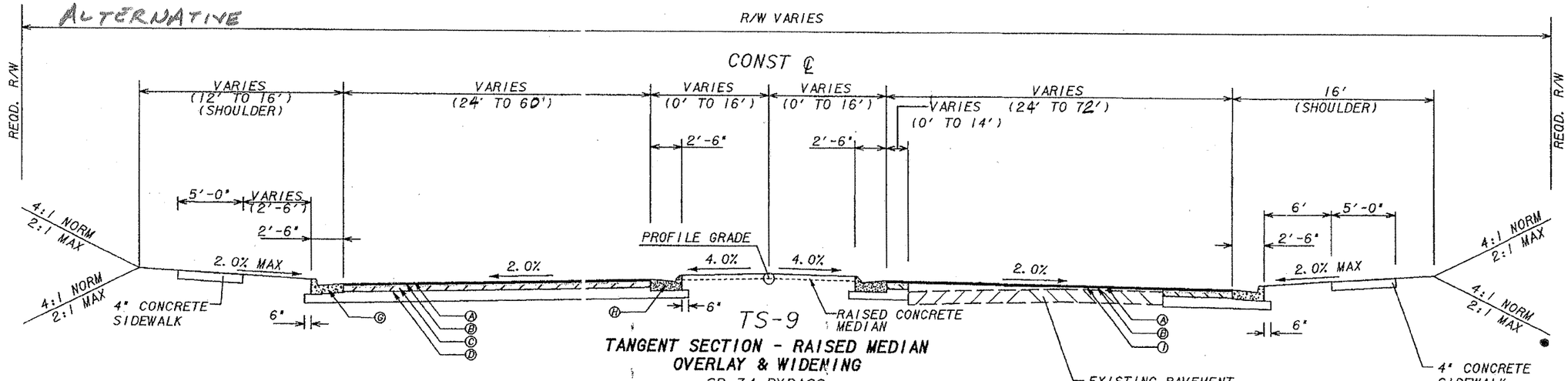


TS-9

TANGENT SECTION - RAISED MEDIAN
OVERLAY & WIDENING

SR 34 BYPASS
STA. 219+81.00 TO STA. 242+00.00
STA. 293+50.00 TO STA. 336+35.00

ALTERNATIVE



TS-9

TANGENT SECTION - RAISED MEDIAN
OVERLAY & WIDENING

SR 34 BYPASS
STA. 219+81.00 TO STA. 242+00.00
STA. 293+50.00 TO STA. 336+35.00

REVISION DATES		

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

TYPICAL SECTIONS

DRAWING No. 5-06

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **11**

Left bicycle lane begins at Station 214+00, right bicycle lane begins at Station 221+00. The project ends at Station 336+25.

Total length of bicycle lane = 2(33625)-21400-22100 = 23,750 lf
Bicycle lane area = 4(23750)/9 = 10,556 yd^2

Pavement section:
A – Asphaltic concrete, 12.5 mm superpave, 165 #/SY
B - Asphaltic concrete, 19 mm superpave, 220 #/SY
C - Asphaltic concrete, 25 mm superpave, 990 #/SY
D – Graded aggregate base, 12”

Asphaltic concrete total = 165 + 220 + 990 = 0.6875 ton/SY

GAB = 1(9)(150)/2000 = 0.45 ton/SY

Pavement cost = $100(0.6875) + $17.40(0.45) = $ 76.58

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **11**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Pavement	SY	10,556	76.58	808,378			
Sub-total				808,378			
Mark-up at 38.57%				311,792			
TOTAL				1,120,170			

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**15**
DESCRIPTION:	**IMPROVE THE ENTRANCE AT JEFFERSON PARKWAY ELEMENTARY SCHOOL**	SHEET NO.:	**1 of 5**

ORIGINAL DESIGN: (Sketch attached)

The current design has a right-in/right-out only movement eastbound from SR 34 Bypass into/out of the Jefferson Parkway Elementary School parking lot. However, motorists have a very short distance to get over three mainline lanes of traffic to make a "U" turn to travel westbound.

ALTERNATIVE: (Sketch attached)

Provide a right-in only to the Jefferson Parkway Elementary School from SR 34 Bypass and construct a new road along the western property line to have motorists exit the school on Jefferson Parkway. The Jefferson Parkway/SR 34 intersection is signalized.

ADVANTAGES:

- Greatly improves ingress/egress to Jefferson Parkway Elementary School
- Relieves congestion on SR 34 Bypass
- Simplifies turning movements
- Takes advantage of a signalized intersection

DISADVANTAGES:

- Increases initial cost
- Careful planning required to minimize/avoid personal vehicle/school bus conflicts at southside of school property
- Requires an additional road/driveway on school property

DISCUSSION:

Traffic has been known to stack-up on the eastbound SR 34 Bypass mainline in the mornings and afternoons at the Jefferson Parkway Elementary School for children drop-offs/pick-ups. This undesirable situation, along with a very short distance to cross over three lanes of traffic to undertake a "U" turn for westbound traffic, is catastrophic – especially after widening the SR 34 Bypass.

Although requiring a new driveway/road on school property, the flow of morning and afternoon traffic is greatly enhanced by a through-passage for children drop-offs and pick-ups. Furthermore, access onto Jefferson Parkway will allow for safer turning movements at the Jefferson Parkway/SR 34 Bypass intersection.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 0**	**—**	**$ 0**
ALTERNATIVE	**$ 33,957**	**—**	**$ 33,957**
SAVINGS	**$ (33,957)**	**—**	**$ (33,957)**

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL
COWETA	STP-164-1(39) & STP-164-1(48)		

COUNTY	PROJECT N
COWETA	STP-164-1(39) &

LIMIT OF CONSTRUCTION
LULLWATER CIRCLE
STA. 21+19.00

21+31.00
30.43'

21+47.00
29.59'

21+00.00
29.55'

21+03.00
30.45'

TRACT 2

295+00

295+43.00
79.00'

295+55.00
75.52'

CONCRETE SIDEWALK

EXIST. R/W

LULLWATER CIRCLE

N 0°58'25" E

WHEELCHAIR RAMP GDOT TYPE A

87
N/F
TOWNCENTER CONDOMINIUMS
TRACT 1 LLC

296+61.00
86.00'

296+67.00
74.68'

RETAIN 121' EXIST. 18" RCP

50'R

23'

20'

2'R (TYP)

FF-1.2

FF-1.3

295+78.87
75.34'

WHEELCHAIR RAMP GDOT TYPE A

296+38.88
74.93'

4" RAISED CONCRETE ISLAND (SEE TYPICAL SECTIONS FOR SPECIAL DETAILS) (TYP)

KC187

PC 296+40.66

46'

89°15'31"

S. R. 34 BYPASS

Curve Data
Δ = KC187 (LT)
T = 59.76
L = 118.52
E = 0.31
R = 5800.00
PI STA = 297+00.42
PI X = 2111618.281
PI Y = 1237511.326
SE = NC

297+97.00
80.00'

297+95.60
71.91'

18" SDP

RETAIN 121' EXIST. 18" RCP

EXIST. R/W

FF-1.1

FF-1.1A

5' CONCRETE SIDEWALK

87
N/F
TOWNCENTER CONDOMINIUMS LLC

BEGIN TAPER
STA. 299+11
54' LT

299+35.79
70.50'

END TAPER
STA. 300+01
56' LT

300+00.00
87.00'

RETAIN 327' EXIST. 18" RCP

TRACT 2

FF-2

REQ'D R/W

18" RCP

FF-2.3

FF-2.2

FF-2.1

END TAPER
STA. 300+01
16' LT

300+28.92
69.56'

300+00.00
72.00'

END TAPER
STA. 300+01
8' LT

40'

FLAT +48

RETAIN 157' EXIST. 36" CMP

FF-3.2B1

FF-3.2B

FF-3.2C

18" SDP

CONST. ℄ S 89°27'57" E

ENC +00

NC +04.47

PT 297+60.18

FF-3.5A

KC187

S. R. 34 BYPASS

18" SDP

301+59.11

N 89°27'57" E 85.00'

OUT 89.94

301+58.95
72.00'

BEGIN TAPER
STA. 297+06
6' RT

18" SDP

BEGIN TAPER
STA. 297+06
14' RT

297+41.00
71.00'

297+93.15
58.07'

BEGIN TAPER
STA. 298+60
54' RT

4" RAISED CONCRETE ISLAND (TYP)

FF-3.4

298+96.00
71.00'

2'R (TYP)

END TAPER
STA. 300+01
56' RT

299+96.00
72.00'

300+26.84
60.43'

NC +48

FF-3.3

18" SDP

24" SDP

FF-3.2

FF-3.1

37.24
69'

295+86.02
54.71'

296+68.00
92.00'

FF-3.6

FF-3.5

18" RCP

EXIST. R/W

5' CONCRETE SIDEWALK

18" SDP

REQ'D R/W

50'R

WHEELCHAIR RAMP GDOT TYPE D

18" SDP

FF-3.4A

20' EXIST. R/W

20'

20'R

5' CONCRETE SIDEWALK

WHEELCHAIR RAMP GDOT TYPE D

FF-3.3A

300+26.00
89.00'

18" SDP

FF-3.2A

EXIST. R/W

301+14.
94.00

85
N/F
INTON M. &
VE W. ODOM

295+86.25
70.00'

S. R. 34 BYPASS
STA. 296+10.31=
LULLWATER CIRCLE
STA. 20+00.00

296+54.00
70.00'

295+86.85
110.00'

86
N/F
BOARD OF EDUCATION OF COWETA

296+61.00
154.00'

34'R

86
N/F
BOARD OF EDUCATION OF COWETA

299+96.00
88.00'

300+75.00
154.00'

32'R

48'R

24'

NANCY & GARY

LEGEND

- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

20 40 60FT.
1" = 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S. R. 34 BYPASS

DRAWING 13-3

W LINE —℄—
& MAINT —C— —F—
SLOPES
DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

DEPAR
OFFICE: C

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL
COWETA	STP-164-1(39) & STP-164-1(48)		

3 OF 5

LIMIT OF CONSTRUCTION
LULLWATER CIRCLE
STA. 21+19.00

LULLWATER CIRCLE

EXIST. R/W

21+31.00
30.43'

21+47.00
29.59'

87
N/F
TOWNCENTER CONDOMINIUMS LLC
TRACT 1

21+00.00
29.55'

WHEELCHAIR RAMP
GDOT TYPE A

21+03.00
30.45'
TRACT 2

295+00

N 0°58'25" E

295+55.00
75.52'

295+43.00
79.00'

CONCRETE SIDEWALK

50'R

EOI

23'

FF-1.2

FF-1.3

295+78.87
75.34'

WHEELCHAIR RAMP
GDOT TYPE A

20'

2'R
(TYP)

296+61.00
86.00'

296+67.00
74.68'

RETAIN 121' EXIST. 18" RCP

18" RCP

296+38.88
74.93'

4" RAISED CONCRETE ISLAND
(SEE TYPICAL SECTIONS FOR SPECIAL DETAILS)
(TYP)

KC187

FF-3.5A

46'

PC 296+40.66

89°15'31"

S. R. 34 BYPASS

Curve Data
ID # = KC187
Δ = 1°01'51" (LT)
T = 59.76
L = 119.62
E = 0.31
R = 5800.00
PI STA = 297+00.42
PI X = 2111618.281
PI Y = 1237511.326
SE = NC

297+97.00
80.00'

297+95.60
71.91'

BEGIN TAPER
STA. 297+11
54' LT

299+35.79
70.50'

END TAPER
STA. 300+01
56' LT

300+00.00
87.00'

RETAIN 327' EXIST. 18" RCP

TRACT FF2

301+59.11
N 89°03'85.00" E
301+58.95
72.00'

18" SDP

RETAIN 121' EXIST. 18" RCP

EXIST. R/W

5' CONCRETE SIDEWALK

FF-1.1

FF-1.1A

EOI

REQ'D. R/W

18" RCP

FF-2

FF-2.3

FF-2.2

END TAPER
STA. 300+01
16' LT

END TAPER
STA. 300+01
8' LT

FF-2.1
300+28.92
69.56'

300+00.00
72.00'

FLAT +48

RETAIN 157' EXIST. 36" CMP

FF-3.2B1

FF-3.2B

FF-3.2C

18" SDP

CONST. ℄ S 89°27'57" E

S. R. 34 BYPASS

ENC +00

PT 297+60.18

BEGIN TAPER
STA. 297+06
6' RT

18" SDP

BEGIN TAPER
STA. 297+06
14' RT

297+41.00
71.00'

297+93.15
58.07'

BEGIN TAPER
STA. 298+60
54' RT

4" RAISED CONCRETE ISLAND
(TYP)

FF-3.4

298+96.00
71.00'

2'R
(TYP)

END TAPER
STA. 300+01
56' RT

NC +04.47

NC ±48

299+96.00
72.00'

300+26.84
60.43'

FF-3.3

FF-3.3A

FF-3.2A

FF-3.2

FF-3.1

24" SDP

EXIST. R/W

5' CONCRETE SIDEWALK

WHEELCHAIR RAMP
GDOT TYPE D

18" SDP

300+26.00
89.00'

301+14.
62.36'

301+14.
94.00

88
N/F
NANCY & GARY

FF-3.5

FF-3.6

18" RCP

EXIST. R/W

5' CONCRETE SIDEWALK

295+86.02
54.71'

296+68.00
92.00'

297+37.24
69'

REQ'D. R/W

50'R

WHEELCHAIR RAMP
GDOT TYPE D

18" SDP

FF-3.4A

20'

20'R

20'

20'R

20'

LT

RT

34'R

48'R

24'

85
N/F
INTON M. &
VE W. ODOM

295+86.25
70.00'

S. R. 34 BYPASS
STA. 296+10.31 =
LULLWATER CIRCLE
STA. 20+00.00

296+54.00
70.00'

295+86.85
110.00'

86
N/F
BOARD OF EDUCATION
OF COWETA

296+61.00
154.00'

86
N/F
BOARD OF EDUCATION OF COWETA

299+96.00
88.00'

300+75.00
154.00'

LEGEND
- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S. R. 34 BYPASS

DRAWING 13-3

W LINE —℄—
& MAINT —G— —F—
SLOPES
DRIVES

BEGIN LIMIT OF ACCESS..... BLA
END LIMIT OF ACCESS..... ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 40 60FT.
1" = 20'

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

DEPAR
OFFICE: C

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 15

SHEET NO.: 4 of 5

400 LF OF PVMT ALONG WEST PROPERTY LINE

400 LF x 16 FT WIDE = 6400 sf ÷ 9 = 711 SY

REMOVE WESTERN DRIVE

220 LF x 16 FT WIDE = 3520 sf ÷ 9 = 391 SY

320 SY

320 SY x $ 76.58/SY = $24505

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **15**

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
Pavement	SY				320	76.58	24,506
Sub-total							24,506
Mark-up at 38.57%							9,452
TOTAL							33,957

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** **Coweta County, Georgia Department of Transportation, District 3** ***Final Design Stage***	ALTERNATIVE NO.:	**17**
DESCRIPTION:	**USE A MODULAR BLOCK MECHANICALLY STABILIZED EMBANKMENT WALL 2 IN LIEU OF A CAST-IN-PLACE CANTILEVER WALL**	SHEET NO.:	**1 of 5**

ORIGINAL DESIGN: (Sketch attached)

The current design denotes Wall No. 2 as a cast-in-place cantilever retaining wall.

ALTERNATIVE: (Sketch attached)

Construct Wall No.2 as a modular block mechanically stabilized embankment (MSE) retaining wall.

ADVANTAGES:

- Initial cost savings
- Requires lower bearing capacity
- Common practice
- Simplifies construction
- Aesthetics

DISADVANTAGES:

- None apparent

DISCUSSION:

MSE walls are easier and quicker to build and require fewer skilled workers than cast-in-place walls. This wall is at the bottom of a 2:1 fill slope and is adjacent to a subdivision. The MSE modular block wall is more attractive than a cast-in-place concrete wall.

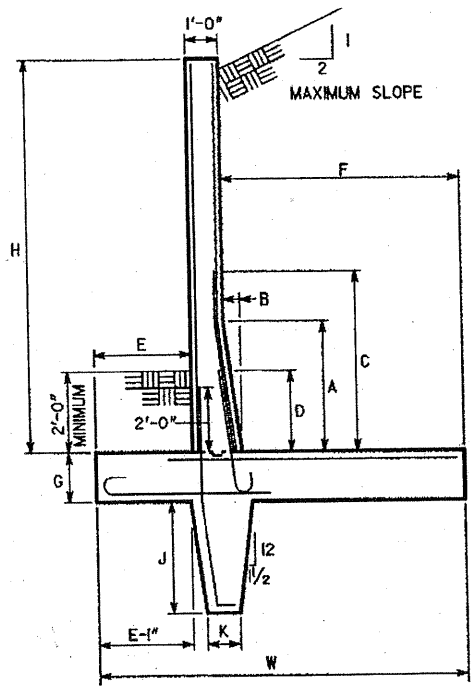
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 248,673**	**—**	**$ 248,673**
ALTERNATIVE	**$ 146,588**	**—**	**$ 146,588**
SAVINGS	**$ 102,085**	**—**	**$ 102,085**

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 17

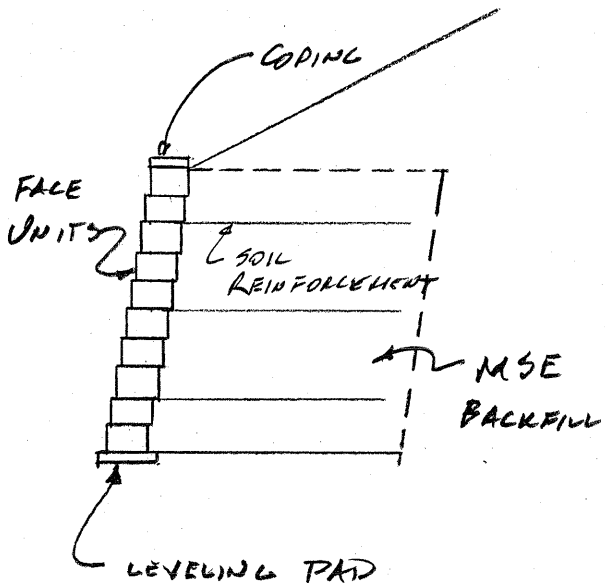
SHEET NO.: 2 of 5

☒ AS DESIGNED



CAST-IN-PLACE
CANTILEVER WALL

☒ ALTERNATIVE



MODULAR BLOCK
MSE WALL

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **17**

SHEET NO.: **3 of 5**

Wall face area = (20408 – 20120)(903.12 – 876.86) – (20250 – 20120)(903.12 – 885.27)
- .5(20408 – 20250)(903.12-885.27) – (42)(878.93 – 876.86)
- (26)(880.95 – 876.86) – (38)(882.97 – 876.86) - (28)(887.06 – 876.86)
- (22)(891.27 – 876.86) - (28)(894.62 – 876.86)
= 7563 – 2320 – 1410 – 87 – 106 – 232 – 286 – 317 – 497
= 2308 SF

Original design:

Stem Volume = 2308(1)/27 = 85.5 CY
Footing Volume = 288(9.75)(1.5)/27 = 156.0 CY
Key Volume = 288(2.25)(1.3125)/27 = 31.5 CY
Total = 273 CY

Reinforcing: Use 130 #/CY = 130(273) = 35,490 LB

Alternative:

Facing area = 2308 SF
Soil reinforcements: assume 1 per each 6 ft^2 of wall face area, 8 feet long
L = (2308/6)(8) = 3077 LF
Backfill: 9 feet wide
V = 2308(9)/27 = 769 CY
Coping length = 288 LF
Leveling pad length = 288 LF

SEC 630 MODULAR BLOCK RETAINING WALL

ALTERNATIVE 17 SHEET 4 OF 5

ITEM NO.	UNITS	L/S UNITS	DESCRIPTION
630-0010	SF		SEGMENTAL CONCRETE FACING UNITS - *** Requires Special Provision ***
630-0100	LF		BACKFILL STABILIZING KEYSTRIP - *** Requires Special Provision ***
630-0200	CY		MODULAR BLOCK RETAINING WALL BACKFILL MATERIAL *** Requires Special Provision ***
630-0300	LF		MODULAR BLOCK RETAINING WALL CONCRETE LEVELING PAD *** Requires Special Provision ***
630-0400	LF		MODULAR BLOCK RETAINING WALL CAST-IN-PLACE COPING, A *** Requires Special Provision ***
630-0500	LF		MODULAR BLOCK RETAINING WALL CAST-IN-PLACE COPING, B *** Requires Special Provision ***
630-0600	LF		MODULAR BLOCK RETAINING WALL PRECAST COPING *** Requires Special Provision ***

PRICES FOR MODULAR BLOCK WALL FROM GEORGIA DOT ESTIMATING

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **17**

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
Class A Concrete	CY	273	541.65	147,870			
Bar Reinforcing Steel	LB	35,490	0.89	31,586			
Facing Units	SF				2,308	19.44	44,868
Soil Reinforcement	LF				3,077	4.50	13,847
Backfill Material	CY				769	32.00	24,608
Coping	LF				288	30.00	8,640
Leveling Pad	LF				288	48.00	13,824
	Sub-total			179,457			105,786
Mark-up at	**38.57%**			69,216			40,802
	TOTAL			248,673			146,588

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**21**
DESCRIPTION:	**REDUCE THE LENGTH OF LEFT TURN LANES THROUGHOUT THE PROJECT**	SHEET NO.:	**1 of 4**

ORIGINAL DESIGN:

The left turn lanes have been designed long enough to accommodate appropriate deceleration distances.

ALTERNATIVE:

Shorten left turn lanes to accommodate storage length only.

ADVANTAGES:

- Reduces pavement area
- Reduces initial cost
- Deceleration lanes are rarely used by patrons on a road this congested

DISADVANTAGES:

- Could slow-down through traffic
- Deceleration occurs on the mainline/shorter storage lanes
- Loss of amenity

DISCUSSION:

Deceleration lanes combined in a left turn lane are rarely used as designed as drivers will always tend to decelerate in the through-lanes prior to entering left turn lanes. Therefore, reduce the length of the left turn lanes to only accommodate adequate storage and increase the amount of median/island.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 573,031**	**—**	**$ 573,031**
ALTERNATIVE	**$ 236,905**	**—**	**$ 236,905**
SAVINGS	**$ 336,126**	**—**	**$ 336,126**

CALCULATIONS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 21

SHEET NO.: 2 of 4

ASSUME 300' MIN. LENGTH OR 30/ACC.

SR 34
AT HOSPITAL RD = 300' x 12' = 3600 SF
= OK.

ROSCOE RD = 450' x 12' = 5400 SF.
= 150' x 12' = 1800 SF

US 29 = 300' x 12' = 3600 SF
= OK

CROSSBROOK DR = OK
= 200' x 12' = 2400 SF

HILLWOOD CIRCLE$_W$ = 250' x 12' = 3000 SF
= 200' x 12' = 2400 SF.

HILLWOOD CIRCLE$_E$ = 200' x 12' = 2400 SF
= 250' x 12' = 3000 SF

ELAINE DR = 200' x 12' = 2400 SF
= 100' x 12' = 1200 SF

CALLOWAY PKWY = 200' x 12' = 2400 SF
= 200' x 12' = 2400 SF

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 21

SHEET NO.: 3 of 4

Postal Pkwy = 150' x 12' = 1800 SF
= 200' x 12' = 2400 SF

TOTAL = 40,200 SF

SIDEROADS:

SR 16 = 200' x 12' = 2400 SF.
= OK

Hospital = 150' x 12' = 1800 SF.

Rescos = 150' x 12' = 1800 SF.
= 200' x 12' = 2400 SF.

TOTAL = 8400 SF

NO CHANGE IN CURB & GUTTER OR DRAINAGE.

NO CHANGE IN RIGHT-OF-WAY.

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **21**

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
Full Depth Pavement	SY	5,400	76.58	413,532			
Concrete Median	SY				5,400	31.66	170,964
Sub-total				413,532			170,964
Mark-up at	**38.57%**			159,499			65,941
TOTAL				573,031			236,905

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **23**

DESCRIPTION: **CUL-DE-SAC LULLWATER CIRCLE**

SHEET NO.: **1 of 7**

ORIGINAL DESIGN: (Sketch attached)

The Lullwater Circle at SR 34 Bypass intersection is being improved by constructing an island to channelize traffic turning into and out of Lullwater Circle and providing curb and gutter for a short distance along Lullwater Circle.

ALTERNATIVE: (Sketch attached)

Construct a cul-de-sac on Lullwater Circle adjacent to the SR 34 Bypass.

ADVANTAGES:

- Eliminates an intersection on SR 34 Bypass
- Reduces cost
- Traffic from Lullwater Circle going to SR 34 Bypass would access SR 34 Bypass at a signalized intersection
- Improves safety on SR 34 Bypass

DISADVANTAGES:

- Traffic on Lullwater Circle would have to access SR 34 Bypass on Calumet Parkway

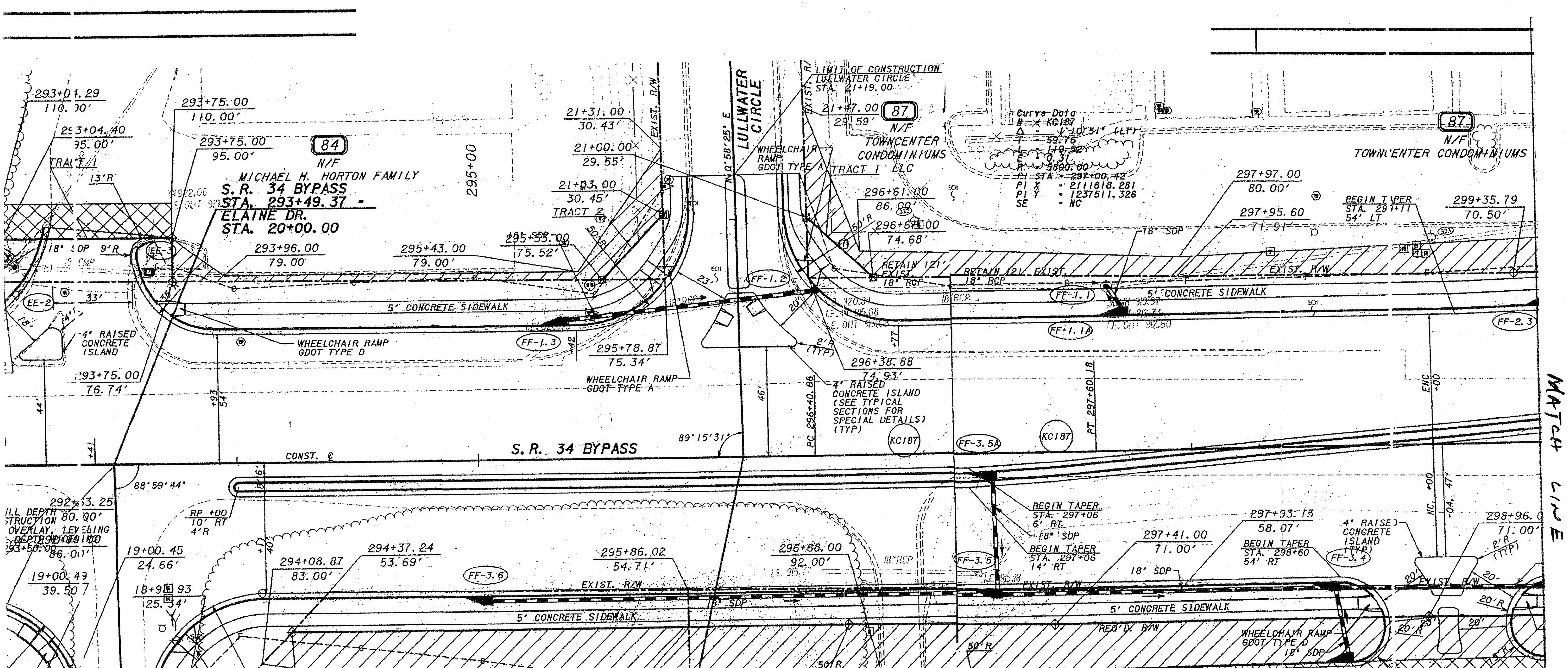
DISCUSSION:

The design year average daily traffic on Lullwater Circle going to SR 34 Bypass (both eastbound and westbound) is 550 vehicles per day. Instead of leaving the direct access to SR 34 Bypass, this alternative would send traffic to Calumet Parkway, where traffic would turn right to get to SR 34 Bypass at a signalized intersection. This will provide safer access to SR 34 Bypass.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 136,382	—	$ 136,382
ALTERNATIVE	$ 21,454	—	$ 21,454
SAVINGS	$ 114,928	—	$ 114,928

ALTERNATIVE
23
SHEET 2 OF 7

AS DESIGNED



ALTERNATIVE
2 3

SHEET 3 OF 7

AS DESIGNED

COUNTY	PROJECT NUMBER
COWETA	STP-164-1(39) & STP-164-1(48)

MATCH LINE

Curve Data
Δ = 8°16'52" (LT)
D = 11.46°
T = 36.20
L = 72.27
E = 1.31
R = 500.00
PI STA = 21+18.20
PI X = 2112386.717
PI Y = 1237609.654
SE = MATCH EXIST.

END PROJECT
STP-164-1(39)
BEGIN PROJECT
STP-164-1(48)
STA. 304+51.43
MILEPOST 5.4
N 1237492.8300
E 2112368.7240

89
N/F
NEWNAN
COWETA
BANK

PROPOSED CONTROL CABINET
PROPOSED SIGNAL POLE

S.R. 34 BYPASS

CONST. ℄ S 89°12'57" E

300+00.00
87.00'

END TAPER
STA. 300+01
56' LT

RETAIN 327' EXIST. 18" RCP

TRAC (FF2)

REQ'D. R/W

18" RCP

FF-2.2

END TAPER
STA. 300+01
16' LT

FF-2.1
300+28.92
69.56'

300+00.00
72.00'

END TAPER
STA. 300+01
8' LT

FF-2

RETAIN 157' EXIST.
36" CMP

FF-3.2B
FF-3.2B
18" SDP
FF-3.2C
18" SDP

18" SDP

299+96.00
72.00'

END TAPER
STA. 300+01
56' RT

300+26.84
60.43'

FF-3.3

18" SDP

5' CONCRETE SIDEWALK

WHEELCHAIR RAMP
GDOT TYPE D

18" SDP
300+26.00
89.00'
FF-3.3A

301+59.11
C1 909.1885.00'
00° 89'54
301+58.95
72.00'

18" SDP
301+14.81
62.36'
FF-3.2
24" SDP
FF-3.1

EXIST. R/W
30" SDP

18" SDP
FF-3.2A

302+45.00
72.00'

EXIST. R/W
5' CONCRETE SIDEWALK

302+59.22
64.53'

FF-2D
18" SDP
FF-3.2E

302+57.28
65.45'

302+71.00
97.00'

302+83.00
72.00'

302+86.00
83.00'

RETAIN 57' EXIST.
36" CMP

FF-5

RETAIN 93' EXIST.
36" CMP

PROPOSED
SIGNAL POLE

BEGIN HEADER
CURB
STA. 303+39

303+52.00
86.00'

303+53.00
72.00'

303+79.47
62.89'

WHEELCHAIR RAMP
GDOT TYPE A

RP +94
12' LT
4'R

PROPOSED
PEDESTRIAN
PEDESTAL
POLE

303+77.01
99.00'

4" RAISED
CONCRETE ISLAND
(SEE TYPICAL
SECTIONS FOR
SPECIAL DETAILS)
(TYP)

303+49.00
72.00'

303+76.00
77.00'

FF-4.1
EXIST. R/W

RETAIN 157' EXIST.
36" CMP

21+55.00
50.55'

21+33.24
51.24'

PT 21+54.27

NC
+33
37'

FLAT
+33

+23
24'

CALUMET PARKWAY

20+85.40
51.52'

PC 20+82.01

RC
+75

28'

RP +78
5' RT
42' 5'R

KC334

3.06%
+44

2-R
(TYP)

3.06%
+00

CONST. ℄

KC27

88°10'10"

RP +00
12' RT
4'R

PROPOSED
PEDESTRIAN
PEDESTAL
POLE

3.06%
+56

22'

N 8°45'21" E

21+13.00
48.45'

FF-4.3A

FF-4.2

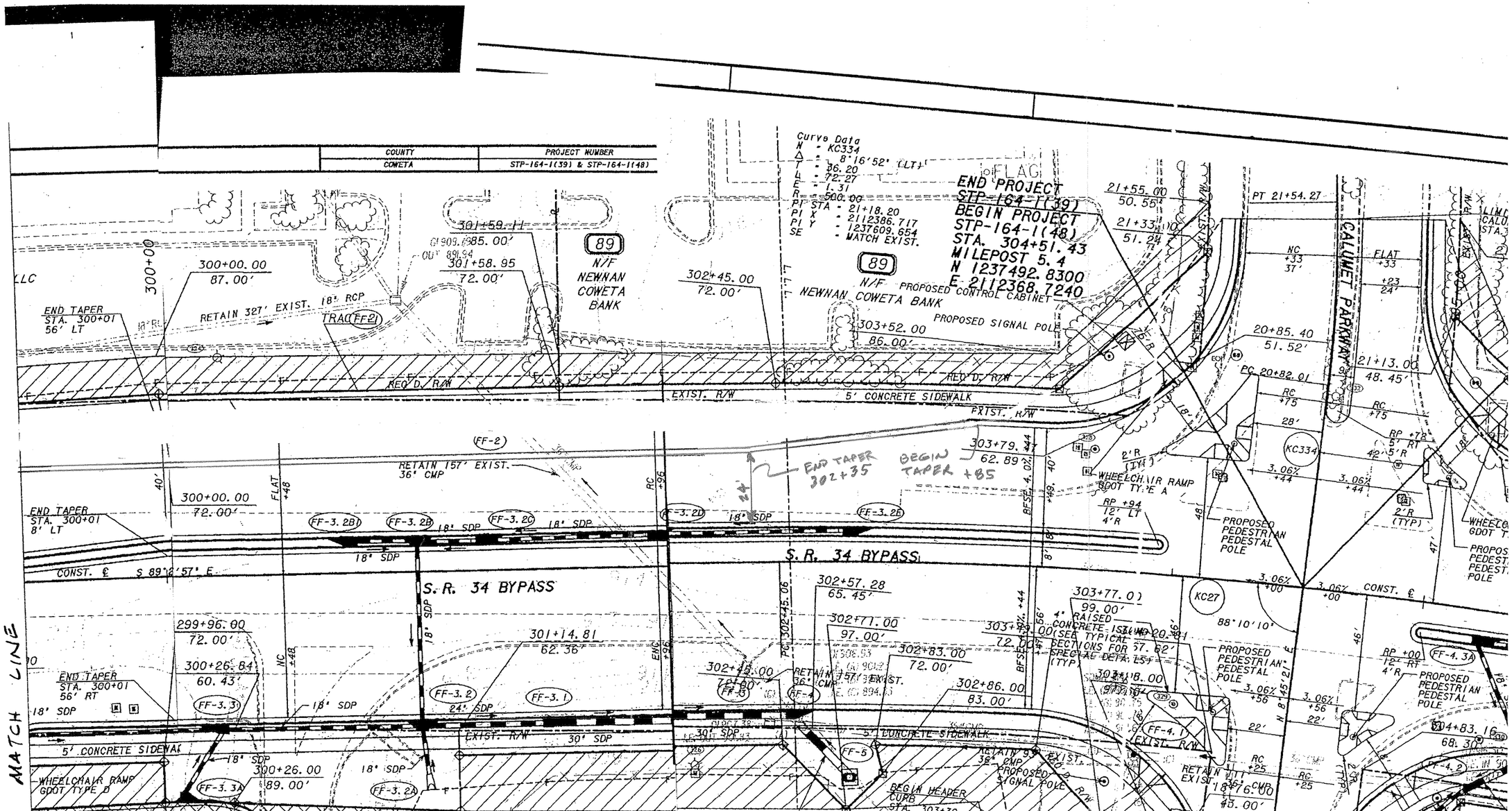
304+83.16
68.31'

ALTERNATIVE
23
SHEET 4 OF 7

ALTERNATIVE

COUNTY	PROJECT NUMBER
COWETA	STP-164-1(39) & STP-164-1(48)

MATCH LINE



ALTERNATIVE
23
SHEET 5 OF 7

ALTERNATIVE

END CONSTRUCTION
LULLWATER CIRCLE

293+01.29
110.00'
293+04.40
95.00'
TRACT 1
293+75.00
110.00'
293+75.00
95.00'
84
N/F
MICHAEL H. HORTON FAMILY
S.R. 34 BYPASS
STA. 293+49.37 -
ELAINE DR.
STA. 20+00.00
295+00
13'R
18" SDP 9'R
EE-1
EE-2
33'
18'
4' RAISED CONCRETE ISLAND
293+75.00
76.74'
293+96.00
79.00'
295+43.00
79.00'
295+88.00
75.52'
21+31.00
30.43'
21+00.00
29.55'
21+03.00
30.45'
TRACT 2
EXIST. R/W
50'R
5' CONCRETE SIDEWALK
WHEELCHAIR RAMP GDOT TYPE D
FF-1.3
295+78.87
75.34'
WHEELCHAIR RAMP GDOT TYPE A
END TAPER
294+65
BEGIN TAPER
295+15
S.R. 34 BYPASS
CONST. ℄
89°15'31"
88°59'44"
PC 296+40.66
KC187
FF-3.5A
KC187
PT 297+60.18
RP +00
10' RT
4'R
292+53.25
ILL DEPTH 80.00'
STRUCTION
OVERLAY, LEVELING
DEPTH 80.00'
293+50.00
86.00'
19+00.45
24.66'
19+00.49
39.50'
18+93
25.54'
294+08.87
83.00'
294+37.24
53.69'
FF-3.6
295+86.02
54.71'
295+68.00
92.00'
18"RCP
EXIST. R/W
5' CONCRETE SIDEWALK
8' SDP
50'R
20' RAD
2°58'25" E
21+47.00
29.59'
87
N/F
TOWNCENTER CONDOMINIUMS
TRACT 1 LLC
WHEELCHAIR RAMP TYPE A
296+61.00
86.00'
296+61.00
74.68'
150'R
RETAIN 121' EXIST. 18" RCP
Curve Data
Δ = 1°40'51" (LT)
D = 0.31°
R = 5500.00'
PI STA = 297+00.42
PI X = 2111618.281
PI Y = 1237511.326
SE = NC
87
N/F
TOWNCENTER CONDOMINIUMS
297+97.00
80.00'
297+95.60
71.91'
BEGIN TAPER
STA. 297+11
54' LT
299+35.79
70.50'
18" SDP
RETAIN 121' EXIST. 18" RCP
FF-1.1
5' CONCRETE SIDEWALK
296+38.88
74.93'
BEGIN TAPER
STA. 297+06
6' RT
18" SDP
BEGIN TAPER
STA. 297+06
14' RT
FF-3.5
297+41.00
71.00'
297+93.15
58.07'
BEGIN TAPER
STA. 298+60
54' RT
4" RAISED CONCRETE ISLAND (TYP.)
FF-3.4
298+96.0
71.00'
2'R (TYP.)
EXIST. R/W
20'
20'R
REQ'D. R/W
WHEELCHAIR RAMP GDOT TYPE D
18' SDP
50'R
ENC +00
NC +04.47
MATCH LINE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **23**

SHEET NO.: **6 of 7**

Sidewalk at Lullwater Circle:
Original $5[2(\pi)(50)/2]/9 = 87$ SY

Proposed $5(135)/9 = 75$ SY

Curb and Gutter at Lullwater:
Original $2(\pi)(50)/2 = 157$ LF

Proposed 135 LF

Pavement:
Original $[.5(30235 + 30285) - .5(29465 + 29515)](12)/9$
$+ 60(28)/9$
$= 1213$ SY

Proposed $\pi(20^2)/9 = 140$ SY

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **23**

SHEET NO.: **7 of 7**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Sidewalk	SY	87	33.96	2,955	75	33.96	2,547
Curb & Gutter	LF	157	16.40	2,575	135	16.40	2,214
Pavement	SY	1,213	76.58	92,892	140	76.58	10,721
	Sub-total			98,421			15,482
Mark-up at	**38.57%**			37,961			5,971
	TOTAL			136,382			21,454

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **24**

DESCRIPTION: **DO NOT EXCAVATE AT BRIDGE OVER THE CSX RAILROAD**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (Sketch attached)

The current bridge preliminary layout shows excavation under the bridge to match the railroad's future typical section.

ALTERNATIVE: (Sketch attached)

Do not excavate for the railroad's future typical section.

ADVANTAGES:

- Initial cost savings
- Eliminates unnecessary work
- Eliminates ponds along the railroad under the bridge

DISADVANTAGES:

- More difficult to place slope paving under the bridge

DISCUSSION:

Since the proposed ditch location is outside of and lower than the existing ditch, water will pond under the bridge, creating a maintenance problem for the bridge. The alternative would leave the existing fill under the bridge up to the berm elevation, and add the required new fill along the sides. The existing railroad ditches would remain in the same location.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 20,505	—	$ 20,505
ALTERNATIVE	$ 0	—	$ 0
SAVINGS	$ 20,505	—	$ 20,505

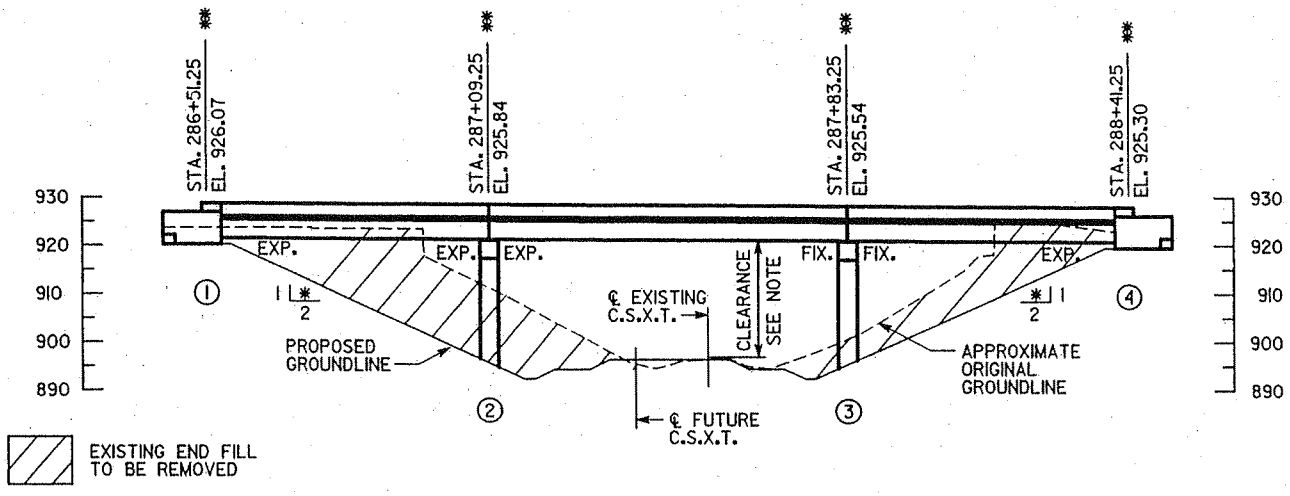
SKETCHES

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 24

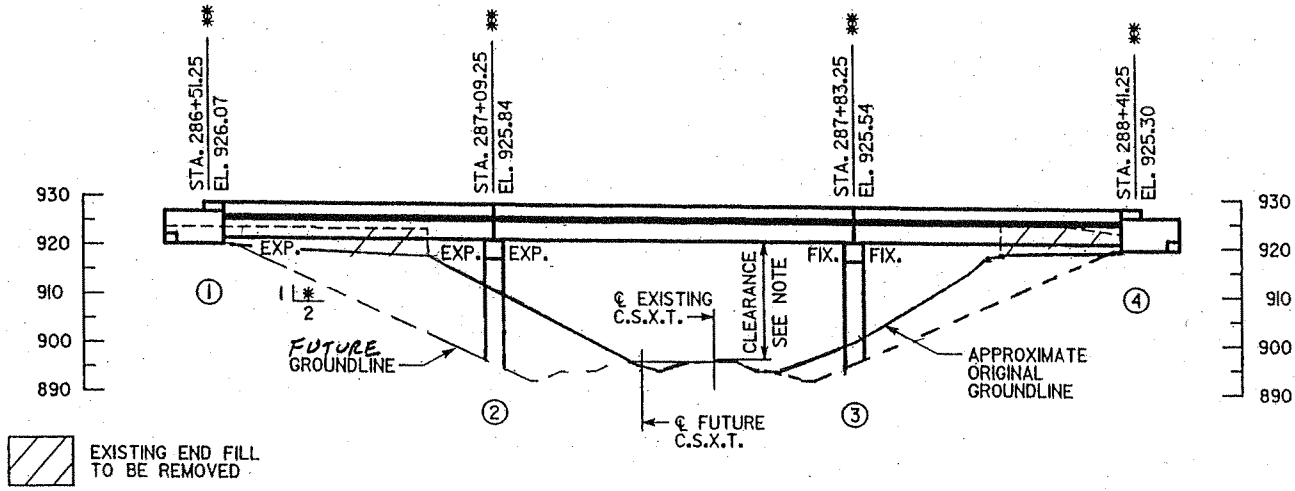
☒ AS DESIGNED

SHEET NO.: 2 of 4



ELEVATION
SCALE: 1"=20'

☒ ALTERNATIVE



ELEVATION
SCALE: 1"=20'

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **24**

Bent 1 end:

Volume = 15(45)(52)/27 = 1300 CY

Bent 4 end:

Volume = 7(55)(52)/27 = 741 CY

Total = 2041 CY

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **24**
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
Unclassified Excavation	CY	2,041	7.25	14,797			
	Sub-total			14,797			
Mark-up at	**38.57%**			5,707			
	TOTAL			20,505			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **25**

DESCRIPTION: **ELIMINATE THE SOUTHERN DRIVEWAY INTO MILANO'S RESTAURANT FROM UNNAMED STREET**

SHEET NO.: **1 of 3**

ORIGINAL DESIGN: (Sketch attached)

The present design indicates a new, reconstructed curb cut on SR 34 Bypass to access an unnamed street at Milano's Restaurant. Immediately north of this access is a driveway into the restaurant's parking lot.

ALTERNATIVE: (Sketch attached)

Eliminate the driveway into Milano's Restaurant parking lot immediately north of the newly reconstructed curb cut on SR 34 Bypass.

ADVANTAGES:

- Improves safety
- Provides safer access to restaurant
- Still provides access to the restaurant's parking lot

DISADVANTAGES:

- None apparent

DISCUSSION:

Keeping the current proposed reconstructed curb cut and the driveway promotes patron's of the restaurant to make an immediate "U" turn into Milano's Restaurant parking lot from SR 34 Bypass. SR 34 Bypass is too busy to warrant such a dangerous maneuver, thereby prompting the closing of the southern access to the restaurant's parking lot.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

COWETA	STP-164-1(39) & STP-164-1(48)	

ALT 25 #2

CONTROL POINT No. 11
¾" IRON PIN
STA. 308+09.32, 37.61' LT
N 1237451.455
E 2112729.262
ELEV. 935.28

91
N/F
PARKWAY VENTURES INC

96
N/F
PIEDMONT PLUMBING & ELECTRIC INC.

MATCH LINE STA. 307+00.00
SEE SHEET 13-37

MATCH LINE STA. 312+00.00
SEE SHEET 13-39

309+77.00
146.00'
309+41.00
130.00'
310+10.00
70.00'
310+27.00
129.00'
309+41.00
85.79'
310+00
16'R
WHEELCHAIR RAMP
GDOT TYPE D
35'R
36'R
TRACT I
BEGIN RETAINING WALL #6
GDOT STD. 9031L
STA. 310+46.00, 86' LT
END RETAINING WALL #6
GDOT STD. 9031L
STA. 310+97.00, 73' LT
310+69.00
74.00'
311+05.00
94.00'
311+00.00
74.00'
311+50.00
97.00'
PROP. R/W
5' CONCRETE SIDEWALK
EXIST. R/W
10'R
10'R
20'
2'R
(TYP)
21'
54'
+37
+85
46
310+47.50
86.00'
WHEELCHAIR RAMP
GDOT TYPE D
5' CONCRETE SIDEWALK
311+00.00
70.00'
4' RAISED
CONCRETE ISLAND
S.R. 34 BYPASS
CONST. ℄
FF-4.3D
18' SDP
8'
BEGIN TAPER
STA. 309+97
6' RT
FF-4.5A
18' SDP
KC27
307+44.50
70.29'
307+44.50
76.00'
307+37.00
81.00'
18' SDP
307+76.86
70.43'
FF-4.4
40'
310+47.41
70.79'
311+77.18
70.41'
FF-4.5
8' SDP
EXIST. R/W
PROP. R/W
5' CONCRETE SIDEWALK
8' SDP
5' CONCRETE SIDEWALK
18' SDP
END RETAINING WALL #5
GDOT STD. 9031L
STA. 307+39.00, 72' RT
END TAPER
STA. 307+00
52' RT
307+81.10
106.00'
308+46.00
89.00'
308+00.00
116.00'
310+43.15
101.00'
311+75.30
93.00'
92
N/F
HOLZBERG FAMILY TRUST
93
N/F
THOMAS & WARREN INC
94
N/F
HERNDON &
HERNDON COMPANIES
LLC

Curve Data
N - KC27
Δ - 41°49'06" (RT)
T - 706.79
L - 1350.26
E - 130.42
R - 1850.00
PI STA - 309+51.85
PI X - 2112869.655
PI Y - 1237499.658
SE - 4.0%

EXISTING

LEGEND
- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

PROPERTY AND EXISTING R/W LINE	BEGIN LIMIT OF ACCESS.....BLA
REQUIRED R/W LINE	END LIMIT OF ACCESS.....ELA
CONSTRUCTION LIMITS —C— —F—	LIMIT OF ACCESS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES	R/W AND LIMIT OF ACCESS
EASEMENT FOR CONSTR OF SLOPES	
EASEMENT FOR CONSTR OF DRIVES	

20 0 20 40 60FT.
SCALE: 1" - 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S.R. 34 BYPASS

DRAWING No. 13-38

COUNTY	PROJECT NUMBER
COWETA	STP-164-1(39) & STP-164-1(48)

ALT 25

#3

CONTROL POINT No. 11
¾" IRON PIN
STA. 308+09.32, 37.61' LT
N 1237451.455
E 2112729.262
ELEV. 935.28

91
N/F
PARKWAY VENTURES INC

96
N/F
PIEDMONT PLUMBING & ELECTRIC INC.

309+77.00
146.00'
309+41.00
130.00'
310+10.00
70.00'
310+27.00
129.00'
310+00
309+41.00
85.79'
WHEELCHAIR RAMP
GDOT TYPE D
35'R
26'R
16'R
BEGIN RETAINING WALL #6
GDOT STD. 9031L
STA. 310+46.00, 86' LT
END RETAINING WALL #6
GDOT STD. 9031L
STA. 310+97.00, 73' LT
310+69.00
74.00'
311+05.00
94.00'
311+00.00
74.00'
311+50.00
97.00'
TRACT 1
REQ'D. R/W
5' CONCRETE SIDEWALK
EXIST. R/W
10'R
10'R
20'
21'
2'R
(TYP)
CP#10
ECI
310+47.50
86.00'
WHEELCHAIR RAMP
GDOT TYPE D
4' RAISED
CONCRETE ISLAND
CONST. ℄
311+00.00
70.00'
MATCH LINE STA. 307+00.00
SEE SHEET 13-37
S.R. 34 BYPASS
FF-4.3D
18' SDP
FF-4.5A
307+44.50
70.29'
307+44.50
76.00'
307+37.00
81.00'
18' SDP
307+76.86
70.43'
FF-4.4
8'
40'
BEGIN TAPER
STA. 309+97
6' RT
310+47.41
70.79'
311+77.18
70.41'
FF-4.5
18' SDP
KC27
MATCH LINE STA. 312+00.00
SEE SHEET 13-39
5' CONCRETE SIDEWALK
EXIST. R/W
REQ'D R/W
END RETAINING WALL #5
GDOT STD. 9031L
STA. 307+39.00, 72' RT
END TAPER
STA. 307+00
52' RT
307+81.10
106.00'
308+46.00
89.00'
310+43.15
101.00'
311+75.30
93.00'
308+00.00
116.00'
92
N/F
HOLZBERG FAMILY TRUST
93
N/F
THOMAS & WARREN INC
94
N/F
HERNDON & HERNDON COMPANIES LLC

Curve Data
N - KC27
Δ - 41°49'06" (RT)
T - 706.79
L - 1350.26
E - 130.42
R - 1850.00
PI STA - 309+51.85
PI X - 2112869.655
PI Y - 1237499.658
SE - 4.0%

Proposed

LEGEND
- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S.R. 34 BYPASS

DRAWING No. 13-38

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**26**
DESCRIPTION:	**ELIMINATE THE CURB CUT AT MILANO'S RESTAURANT ON SR 34 BYPASS**	SHEET NO.:	**1 of 3**

ORIGINAL DESIGN: (Sketch attached)

The present design indicates a new, reconstructed curb cut on SR 34 Bypass to access an unnamed street at Milano's Restaurant.

ALTERNATIVE: (Sketch attached)

Eliminate the curb cut from SR 34 Bypass to the aforementioned unnamed street at Milano's Restaurant.

ADVANTAGES:

- Reduces the number of driveways on SR 34 Bypass
- No change in cost
- Improves safety on both SR 34 Bypass and unnamed street
- Provides a safer access to restaurant

DISADVANTAGES:

- Eliminates direct access to Milano's Restaurant from SR 34 Bypass
- Undesirable for the proprietor

DISCUSSION:

SR 34 Bypass has numerous access points on the north side of the highway. The reconstructed driveway onto the unnamed street at Milano's Restaurant can easily be eliminated while still allowing access to the restaurant, albeit not as conveniently as the current situation. However, the improvement along this curve is greatly improved minimizing the potential for accidents.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

ALT 26 #2

CONTROL POINT No. 11
¾" IRON PIN
STA. 308+09.32, 37.61' LT
N 1237451.455
E 2112729.262
ELEV. 935.28

91
N/F
PARKWAY VENTURES INC

96
N/F
PIEDMONT PLUMBING & ELECTRIC INC.

309+77.00
146.00'
309+41.00
130.00'
310+10.00
70.00'
310+27.00
129.00'
310+00

309+41.00
85.79'
WHEELCHAIR RAMP
GDOT TYPE D
35'R
26'R
16'R

BEGIN RETAINING WALL #6
GDOT STD. 9031L
STA. 310+46.00, 86' LT
END RETAINING WALL #6
GDOT STD. 9031L
STA. 310+97.00, 73' LT

TRACT 1
PROP. R/W
EXIST. R/W
5' CONCRETE SIDEWALK
10'R
10'R
2'R (TYP)
20'
21'
310+69.00
74.00'
311+05.00
94.00'
311+00.00
74.00'
311+50.00
97.00'
310+47.50
86.00'
311+00.00
70.00'
WHEELCHAIR RAMP
GDOT TYPE D
4" RAISED
CONCRETE ISLAND
EOI
CP#10
S.R. 34 BYPASS
CONST. ℄
MATCH LINE STA. 307+00.00
SEE SHEET 13-37
MATCH LINE STA. 312+00.00
SEE SHEET 13-39
FF-4.3C
FF-4.5A
18" SDP
307+44.50
70.29'
307+44.50
76.00'
307+37.00
81.00'
18" SDP
307+76.86
70.43'
FF-4.4
8'
40'
BEGIN TAPER
STA. 309+97
6' RT
310+47.41
70.79'
311+77.18
70.41'
FF-4.5
KC27
5' CONCRETE SIDEWALK
EXIST. R/W
PROP. R/W
END RETAINING WALL #6
GDOT STD. 9031L
STA. 307+39.00, 72' RT
END TAPER
STA. 307+00
52' RT
307+81.70
106.00'
308+46.00
89.00'
308+00.00
116.00'
310+43.15
101.00'
311+75.30
93.00'
92
N/F
HOLZBERG FAMILY TRUST
93
N/F
THOMAS & WARREN INC
94
N/F
HERNDON & HERNDON COMPANIES LLC

Curve Data
N - KC27
Δ - 41°49'06" (RT)
T - 706.79
L - 1350.26
E - 130.42
R - 1850.00
PI STA - 309+51.85
PI X - 2112869.655
PI Y - 1237499.658
SE - 4.0%

EXISTING

LEGEND
HISTORICAL BOUNDARY
STREAM BUFFER
WETLANDS

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S.R. 34 BYPASS

DRAWING No. 13-38

						COMETA	STP-164-1(39) & STP-164-1(48)

CONTROL POINT No. 11
¾" IRON PIN
STA. 308+09.32. 37.61' LT
N 1237451.455
E 2112729.262
ELEV. 935.28

91
N/F
PARKWAY VENTURES INC

96
N/F
PIEDMONT PLUMBING & ELECTRIC INC.

309+41.00
130.00'

309+77.00
146.00'

310+10.00
70.00'

310+27.00
129.00'

309+41.00
85.79'

TRACT 1

35' R

26' R

BEGIN RETAINING WALL #6
GDOT STD. 9031L
STA. 310+46.00, 86' LT

END RETAINING WALL #6
GDOT STD. 9031L
STA. 310+97.00, 73' LT

310+69.00
74.00'

311+05.00
94.00'

311+00.00
74.00'

311+50.00
97.00'

REQ'D. R/W

EXIST. R/W

5' CONCRETE SIDEWALK

5' CONCRETE SIDEWALK

EOI

CP#10

310+47.50
86.00'

311+00.00
70.00'

MATCH LINE STA. 307+00.00
SEE SHEET 13-37

S.R. 34 BYPASS

CONST. ℄

FF-4.3C

FF-4.5A

18" SDP

307+44.50
70.29'

307+44.50
76.00'

307+37.00
81.00'

307+76.86
70.43'

FF-4.4

8'

40'

BEGIN TAPER
STA. 309+97
6' RT

18" SDP

KC27

310+47.41
70.79'

311+77.18
70.41'

FF-4.5

MATCH LINE STA. 312+00.00
SEE SHEET 13-39

5' CONCRETE SIDEWALK

EXIST. R/W

REQ'D. R/W

END RETAINING WALL #5
GDOT STD. 9031L
STA. 307+39.00, 72' RT

END TAPER
STA. 307+00
52' RT

307+81.10
106.00'

308+46.00
89.00'

308+00.00
116.00'

310+43.15
101.00'

311+75.30
93.00'

92
N/F
HOLZBERG FAMILY TRUST

93
N/F
THOMAS & WARREN INC

94
N/F
HERNDON &
HERNDON COMPANIES
LLC

Curve Data
N - KC27
Δ - 41°49'06" (RT)
T - 706.79
L - 1350.26
E - 130.42
R - 1850.00
PI STA - 309+51.85
PI X - 2112869.655
PI Y - 1237499.658
SE - 4.0%

Act 26 #3

Proposed

LEGEND
- HISTORICAL BOUNDARY
- STREAM BUFFER
- WETLANDS

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" - 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S.R. 34 BYPASS

DRAWING No. 13-38

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**27**
DESCRIPTION:	**DO NOT IMPROVE DRIVEWAY TO WAHOO CREEK WATER POLLUTION CONTROL PLANT**	SHEET NO.:	**1 of 4**

ORIGINAL DESIGN:

The existing driveway to the Wahoo Creek Water Pollution Control Plant is to be reconstructed to improve the intersection angle and to align with Hillwood Circle East on the opposite side of SR 34 Bypass.

ALTERNATIVE:

Make no improvements to the driveway.

ADVANTAGES:

- Reduces cost
- Current driveway with signal is adequate

DISADVANTAGES:

- Intersection of existing driveway is slightly east of opposite intersection with Hillwood Circle East
- Intersection angle of existing driveway is not optimal

DISCUSSION:

There is very little traffic using this driveway, so the realignment and reconstruction are of little benefit. In addition, since this intersection is to be signalized, all turning movements are facilitated further negating the need to reconstruct the existing driveway.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 20,432**	**—**	**$ 20,432**
ALTERNATIVE	**$ 0**	**—**	**$ 0**
SAVINGS	**$ 20,432**	**—**	**$ 20,432**

STORAGE
65
N/F
RONNY D. JONES
70
N/F
COWETA
COUNTY
23+40.00
30.00'
PT 23+51.77
N 2°55'27" W
AA-1
23+43.00
20.00'
23+15.11
36.00'
22+55.00
34.00'
22+28.00
53.00'
21+51.00
41.00'
58'
23+34.66
21.67'
N 39°59'49" E
DRIVEWAY
69
N/F
287 MILLARD FARMER IND. BLVD. LLC
262+25.00
110.00'
261+82.00
121.00'
261+56.69
98.00'
262+94.72
125.00'
S.R. 34 BYPASS
STA. 261+85.94 -
HILLWOOD CIRCLE EAST
STA. 20+00.00
287
263+50
73.0
50'R
PROPOSED
SIGNAL POLE
262+44.77
73.00'
WHEELCHAIR
RAMP
GDOT TYPE A
PC 20+49.95
5' CONCRETE SIDEWALK
STORAGE
PROPOSED
PEDESTRIAN
PEDESTAL
POLE
262+32.83
42.42'
262+57.55
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262+77.90
98.82'
262+53.00
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PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **27**

Driveway reconstruction is approximately 220 feet long and 24 feet wide.
Driveway area = 220(24)/9 = 587 SY

Commercial driveway typical section consists of:
- 12.5 mm superpave, 165 #/SY
- 19 mm superpave, 220 #/SY
- 6” Graded aggregate base

Total asphalt = 165 + 220 = 0.1925 TN/SY
GAB: 0.5(9)(150)/2000 = 0.3375 TN/SY

Asphalt = 0.1925(587) = 113 TN
GAB = 0.3375(587) = 198 TN

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **27**

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
Asphalt Pavement	TN	113	100.00	11,300			
Graded Aggregate	TN	198	17.40	3,445			
Sub-total				14,745			
Mark-up at	**38.57%**			5,687			
TOTAL				20,432			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **28**

DESCRIPTION: **DO NOT DEVIATE FROM ORIGINAL ALIGNMENT AT COWETA-FAYETTE ELECTRICAL**

SHEET NO.: **1 of 5**

ORIGINAL DESIGN:

The design indicates the mainline alignment is being shifted to the south to avoid/minimize impacts to a currently designated environmentally sensitive area. This requires the existing utility poles, carrying both electrical and television cables, to be relocated. An existing sanitary sewer force main of an unknown depth may also have to be relocated, although this is not currently indicated on the design documents.

ALTERNATIVE: (Sketch attached)

Follow the original alignment as the rest of the project and provide for a longer/taller retaining wall when approaching the potentially sensitive environmental area.

ADVANTAGES:

- Fewer alignment interruptions
- Reduces right-of-way needs
- Fewer impacts on utilities
- Initial cost savings
- Easier construction and staging
- Simplifies design

DISADVANTAGES:

- Taller retaining wall
- Aesthetics

DISCUSSION:

There is a tremendous amount of work being contemplated to avoid a small, potentially sensitive environmental area. The expense may not justify the minor protection being provided. If required, construct a taller and/or longer retaining wall within this area of the project.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 1,009,855	—	$ 1,009,855
ALTERNATIVE	$ 497,447	—	$ 497,447
SAVINGS	$ 512,408	—	$ 512,408

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 28

SHEET NO.: 2 of 5

UTILITIES:

→ ASSUME SEWER FORCE MAIN IS LOW ENOUGH TO NOT REQ. MOVING.

→ ELECTRICAL / TV →
12 POLES NEED TO BE MOVED @ $3000 EA PER GDOT.

ASSUME 10% OF UTILITY COSTS ARE FOR THIS LINE IN THIS AREA. → $290,202 CURRENTLY PROGRAMMED.

∴ LS UTILITY = 12(3000) + 0.10(290,202)

= $65,020

//

RETAINING WALL: DOUBLES IN SQUARE FOOTAGE.

COST (SEE. ALT 17) $77.77/SQ FT.

2308 SF x 2 = 4616 SF

//

ACT 28

3 of 5

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-164-1(39), COWETA COUNTY **OFFICE** ATLANTA, GEORGIA

PI. No. 322400

SR 34 BYPASS FROM SR 16 TO JEFFERSON PKWY **DATE** DECEMBER 15, 2006

FROM BABS ABUBAKARI, P.E., OCD/PD

TO Brian Summers, P.E., Project Review Engineer

SUBJECT REVISIONS TO PROGRAMMED COST

NO REVISION REQUIRED YES **Project Manager:** RICK REASONS

PROGRAMMED COST: **Last Estimate Date:** 9/11/06

- Construction Cost $23,445,000.00
- Right of Way Cost $9,531,000.00
- Reimbursable Utility Cost

Assume 10% is for this Utility

NEW COST ESTIMATES:

- Construction Cost * $23,445,000.00
- Right of Way Cost $9,531,000.00
- Reimbursable Utility Cost $290,202.00

* Contains 10% E & C

Reasons for the cost revisions: UTILITY ESTIMATE

c: Jamie Simpson, Financial Management Administrator

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 28

SHEET NO.: 4 of 5

RIGHT OF WAY:

(45' x 300') + (45' x 500') + (35' x 200')
+ (20' x 360') = 50,200 □'

1.152 ACRES.

WITHIN RURAL SECTION ($3.85/SF)

NO APPARENT DISPLACEMENTS.

//

NO PAVEMENT QUANTITY CHANGES

//

EARTHWORK PRICES ARE THE SAME
AND ARE ALMOST AN EVEN TRADE.

NO PRICE CHANGE.

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **28**

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
Utilities	LS	1	65,020	65,020			
Retaining Wall	SF	2,308	77.77	179,493	4,616	77.77	358,986
Construction Subtotal				244,513			358,986
Construction Markup at 38.57%				94,309			138,461
Construction Total				338,822			497,447
Right-of-Way	SF	50,200	3.85	193,270			
ROW Subtotal				193,270			
ROW Markup at 247.20%				477,763			
ROW Total				671,033			
Sub-total				1,009,855			497,447
Mark-up at				INCL			INCL
TOTAL				1,009,855			497,447

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**29**
DESCRIPTION:	**IMPROVE THE CROSS BROOK DRIVE AND HARPERS FARM DRIVE INTERSECTION AT SR 34 BYPASS**	SHEET NO.:	**1 of 1**

ORIGINAL DESIGN:

The present design indicates a very short weave between right turns from Cross Brook Drive onto SR 34 Bypass, from Harpers Farm Drive onto SR 34 Bypass, and from Cross Brook Drive to Harpers Farm Drive. This weave lane ends immediately at Harpers Farm Drive.

ALTERNATIVE:

Add an access lane after Harpers Farm Drive to allow the traffic from Cross Brook Drive more time to merge onto SR 34 Bypass, i.e., lengthen the weave lane.

ADVANTAGES:

- Relieves congestion due to merge
- Eliminates confusion associated with drives being too close together
- Improves safety

DISADVANTAGES:

- Increases initial cost
- Could result in purchase of additional right-of-way
- Still retains an undesirable condition of two ingress/egress drives very close together

DISCUSSION:

Access to the residential neighborhoods served by Cross Brook and Harper Farms Drives is only from SR 34 Bypass creating a tenuous condition associated with the closeness of the drives along SR 24 Bypass. Although lengthening the weave beyond Harper Farms Drive will help with some of the problems, it does not solve all the issues.

Additional roads could be constructed so access to these neighborhoods could be redirected to Sprayberry Road via Casey Road or to US 29/SR14/Jackson Street albeit at a high right-of-way cost.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **30**

DESCRIPTION: **RETAIN RONNY D. JONES ENTERPRISES DRIVEWAY IN ITS CURRENT LOCATION AND IMPROVE AS APPROPRIATE**

SHEET NO.: **1 of 2**

ORIGINAL DESIGN: (Sketch attached)

The current design relocates the Ronny D. Jones Enterprises driveway approximately 20 feet to the east and installs a 4-inch raised concrete island to direct traffic.

ALTERNATIVE:

Retain the Ronny D. Jones Enterprises driveway in its current location and provide only those necessary improvements to improve ingress/egress.

ADVANTAGES:

- Lessens impact to neighbors
- No additional cost
- Reduces need to close/add a curb cut
- Reduces construction risk – no potential underground utility disturbances

DISADVANTAGES:

- Construction staging may be more difficult
- Tighter geometry
- Not as convenient

DISCUSSION:

The existing driveway at Ronny D. Jones Enterprises (Station 256+00) is used by employees and patrons of that establishment and has served them well in the past – even at the noted skew angle. Since a new signal is being provided at the entrance to the Wahoo Water Pollution Control Plant/Hillwood Circle intersection, traffic gaps will occur naturally to allow easy access to and from the property. During construction, access to SR 34 Bypass can be easily attained at the Wahoo Water Pollution Control Plant drive via the pipe yard.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

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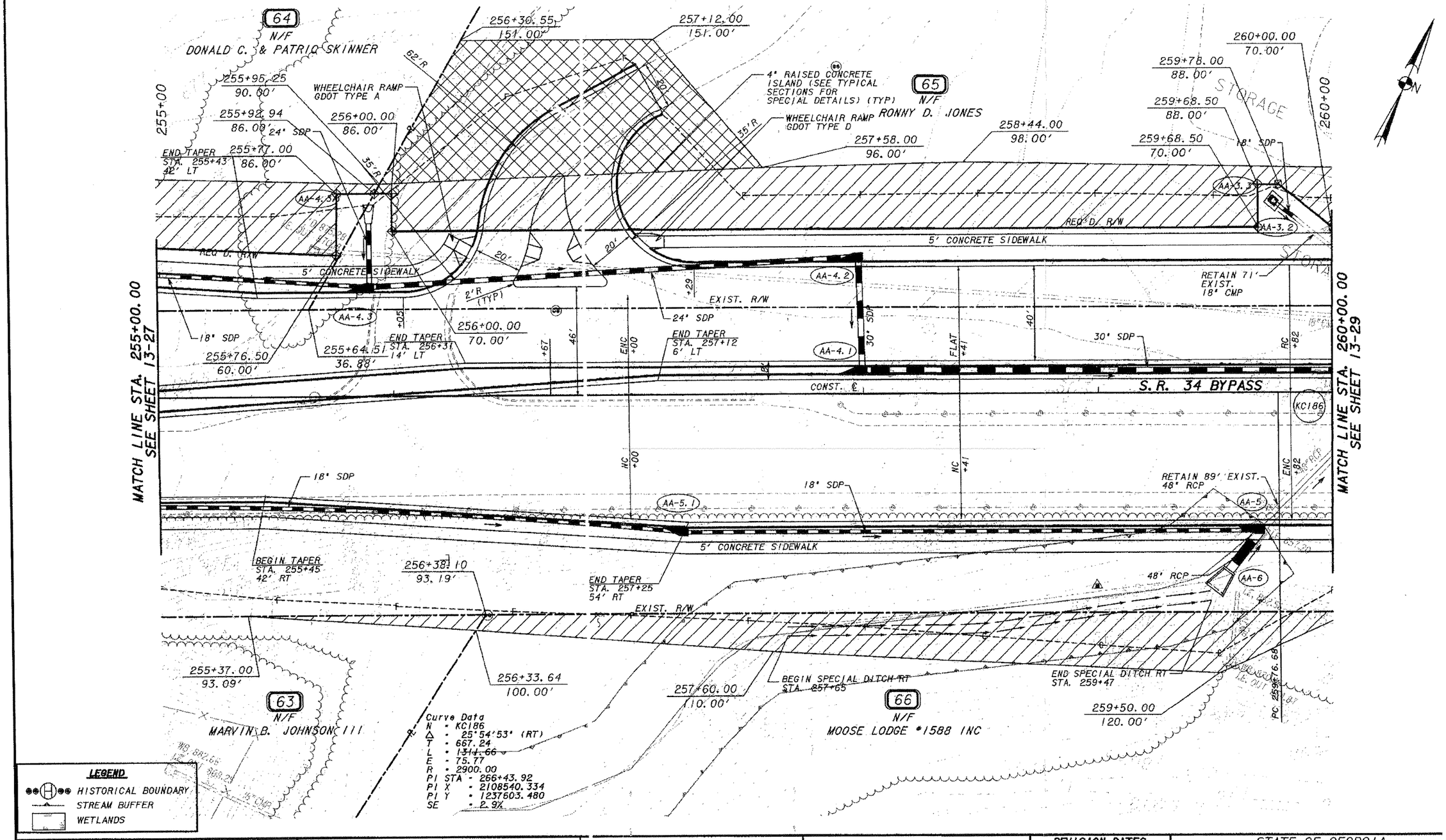
SHEET 2 OF 2

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL SHEE
COWETA	STP-164-1(39) & STP-164-1(48)		



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINT OF SLOPES & UTILITIES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN

MAINLINE PLAN
S.R. 34 BYPASS

DRAWING 13-

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**32**
DESCRIPTION:	**REMOVE EXCESS WIDTH AT RIGHT TURNS FROM US 29 ONTO SR 34 BYPASS**	SHEET NO.:	**1 of 5**

ORIGINAL DESIGN: (Sketch attached)

The current design indicates an additional 12-ft. width at the right turn lanes (tapers to zero) which is currently striped out.

ALTERNATIVE: (Sketch attached)

Remove the additional width with a single, wide striped line separating right turns from through lanes.

ADVANTAGES:

- Reduces right-of-way needs
- Reduces pavement need
- Initial cost savings
- Conforms to Department standards
- Allows alignment shift to reduce retaining wall at Phillips 66 service station

DISADVANTAGES:

- None apparent

DISCUSSION:

The striped additional width is not needed and leads to a design that uses an excessive amount of pavement and requires a retaining wall at the service station on the northeast corner of the intersection of US 29 and SR34 Bypass.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 33,212**	**—**	**$ 33,212**
ALTERNATIVE	**$ 0**	**—**	**$ 0**
SAVINGS	**$ 33,212**	**—**	**$ 33,212**

32

SHEET 2 OF 5

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL
COWETA	STP-164-(139) & STP-164-(148)		

ALT 32 SR #2

TRAFFIC STRIPE-WHITE DETAIL "C" (TYP.) 33 SQ. YDS.

SIGN

SEE CROSSWALK DETAIL (TYP.)

5" SOLID DOUBLE YELLOW

TRAFFIC STRIPE-WHITE DETAIL "A" (TYP.) 106 SQ. YDS.

PARKING

5" SOLID WHITE (TYP.)

5" SKIP WHITE (TYP.) (12' SEG., 6' GAP)

U.S. 29/S.R. 14/JACKSON STREET

N 53°51'23" E

CONST. ℄

PC 226+75.35

TRAFFIC STRIPE-WHITE DETAIL "B" (TYP.) 249 SQ. YDS.

Franklin Peachtree City

TRAFFIC STRIPE-WHITE DETAIL "A" (TYP.) 584 SQ. YDS.

TYPE E ARROW (TYP.)

RAMP HOUSE

HEAVY FOLIAGE

IVY FOLIAGE

25+03 PARKING

TRAFFIC STRIPE-WHITE DETAIL "C" (TYP.) 90 SQ. YDS.

RPM - 80' O.C. (TYP.) SEE GDOT DETAIL - 15A

EL 926.98

EL 924.58

EL 928.10 LE. IN 924.32 LE. OUT 924.22

EL 925.51

EL 922.47

5" SOLID DOUBLE YELLOW

5" SKIP WHITE (TYP.) (12' SEG., 30' GAP)

TYPE E ARROW (TYP.)

SEE CROSSWALK DETAIL (TYP.)

PARKING

Curve Data (C30')
Δ = 15°35'09" (RT.)
T = 196.13
L = 398.76
E = 5.63
R = 2000.00
P.I. STA = 22+05.10
P.I. N = 2104611.132
P.I. E = 1031136.543

20 0 20 40 60FT.
SCALE: 1" = 20'

EXISTING

CITY AND EXISTING R/W LINE	——℄——
PROPOSED R/W LINE	——℄——
CONSTRUCTION LIMITS	——C——F——
EASEMENT FOR CONSTR & MAINT	
SLOPES & UTILITIES	
EASEMENT FOR CONSTR OF SLOPES	
EASEMENT FOR CONSTR OF DRIVES	

BEGIN LIMIT OF ACCESS	BLA
END LIMIT OF ACCESS	ELA
LIMIT OF ACCESS	
R/W AND LIMIT OF ACCESS	

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN
SIGNING AND MARKING

[redacted]

OFFICE: CONSULTANT DESIGN
SIGNING A

32

SHEET 3 OF 5

COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
COWETA	STP-164-(139) & STP-164-(148)		

AJT 32

#3

MATCH LINE STA. 27+00.00
SEE SHEET 26-57

Proposed

REVISION DATES		

SCALE: 1" = 20'

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN
SIGNING AND MARKING PLANS

DRAWING No. 26-56

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 3C

SHEET NO.: 4 of 5

Asphalt Area Saved:

$$NB = \frac{(300')(12')(\frac{1}{2})}{27} = 66.7\ SY$$

$$SB = \frac{(360')(12')(\frac{1}{2})}{27} = 80.0\ SY$$

//

R/W:

$NB = (66.7)(9) = 600.3\ SF$

$SB = (80.0)(9) = 720.0\ SF$

Use $3.85/SF

//

Cut/Fill

Negligible.

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **32**

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
Full Depth Pavement	SY	146.7	76.58	11,234			
Construction Subtotal				11,234			
Construction Markup at 38.57%				4,333			
Construction Total				15,567			
Right-of-Way	SF	1,320	3.85	5,082			
ROW Subtotal				5,082			
ROW Markup at 247.20%				12,563			
ROW Total				17,645			
Sub-total				33,212			
Mark-up at				INCL			
TOTAL				33,212			

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**33**
DESCRIPTION:	**MINIMIZE THE NUMBER OF ACCESS POINTS TO THE PHILLIPS 66 GAS STATION AT SR 70/ROSCOE ROAD AND SR 34 BYPASS**	SHEET NO.:	**1 of 1**

ORIGINAL DESIGN:

The current design delineates three driveways on Roscoe Road leading to the existing Phillips 66 gas station located at the SR 70/Roscoe Road and SR 34 Bypass intersection. Only one of these driveways is to be removed on the SR 70/Roscoe Road side of the station.

ALTERNATIVE:

Remove all but one of the driveways into the existing Phillips 66 gas station located at the SR 70/Roscoe Road and SR 34 Bypass intersection.

ADVANTAGES:

- Less turning movement conflicts into SR 34 Bypass from SR 70/Roscoe Road
- Eliminates confusion associated with driveways being too close together
- No additional cost
- Improves safety

DISADVANTAGES:

- Reduces access to the place of business
- Harder to reach from southbound SR 70/Roscoe Road

DISCUSSION:

One driveway into the gas station is sufficient to handle the anticipated business load. Eliminating two of the three driveways will improve traffic safety to and from the gas station. Furthermore, the alternative eliminates hindrance to the right turn movements from SR 70/Roscoe Road onto SR 24 Bypass.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

VALUE ENGINEERING ALTERNATIVE

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: **36**

DESCRIPTION: **USE 11-FT. WIDE TRAVEL LANES IN LIEU OF 12-FT. LANES**

SHEET NO.: **1 of 5**

ORIGINAL DESIGN: (Sketch attached)

The current design calls for 12-ft. wide travel lanes throughout the project.

ALTERNATIVE: (Sketch attached)

Use 11-ft. wide travel lanes throughout the project in lieu of 12-ft. lanes.

ADVANTAGES:

- Reduces right-of-way needs
- Initial cost savings
- Reduces retaining wall needs
- Reduces bridges width

DISADVANTAGES:

- Challenges a Department standard for lanes widths in this application
- Potentially, drivers could feel cramped when next to another vehicle

DISCUSSION:

The design speed does not warrant 12-ft. travel lanes. However, 12-ft. travel lanes is a Department standard especially if higher volume of truck traffic is anticipated. Notwithstanding, the initial cost savings and reduction in right-of-way requirements merits a second look at this alternative.

Note: *The unit cost for the new bridge at $70.00/square foot (SF) appears to be low; a more prudent cost would be $90.00/SF.*

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 1,761,682**	**—**	**$ 1,761,682**
ALTERNATIVE	**$ 0**	**—**	**$ 0**
SAVINGS	**$ 1,761,682**	**—**	**$ 1,761,682**

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 36

SHEET NO.: 2 of 5

REDUCED PAVEMENT SY AREA:

LENGTH = 4.087 MILES ≅ 7195 Ft

WIDTH = 4 LANES x 1 ft = 4 ft = 1.33 Yd

(7195)(1.33) ≅ 9570 SY

NOTE: 1 ft @ OVERLAY

3 ft @ FULL DEPTH $76.58/SY

FULL DEPTH = $\frac{(9570)(3)}{4}$ (76.58) ≅ $549,691

OVERLAY

ASSUME 4" of LEVELING = 435 lb/SY

ASPHALT = 165 + 220 = 385 lb/SY

ASPHALT = $100/TON x 0.1925 TON/SY = $ 19.25/SY

LEVELING = $100/TON x 0.2175 TON/SY = $ 21.75/SY

TOTAL = $ 41.00/SY

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 36

SHEET NO.: 3 of 5

OVERHEAD = $\frac{(9570)}{4}(41^{00}) \cong \$98,113$

BRIDGE COST = $(\$70/SF)(4')(190') = \$53,200$

CUT/FILL SAVINGS.

AVERAGE INCREASE IN ROAD WIDTH = 100'

$\therefore 4' \cong 4\%$

REDUCE CUT & FILL BY 4%.

BORROW = $(0.04)(317927) = 12,718$ CY

CUT = $(0.04)(121771) = 4871$ CY

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 36

SHEET NO.: 4 of 5

DRAINAGE STRUCTURES.

8'x8' BARREL = 1.404 CY/FT ($541.65)
= 166.2 lb/st. ($0.89)

= $ 908.40/st

10'x5' TRIPLE BOX = 2.995 CY/FT ($541.65)
= 327.1 lb/st ($0.89)

= $ 1642.54/st.

COST WORKSHEET

PROJECT: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO: **36**

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
Full Depth Pavement	SY	7,178	76.58	549,691			
Overlay Pavement	SY	2,393	41.00	98,113			
Bridge	SF	760	70.00	53,200			
Excavation	CY	4,871	7.25	35,315			
Borrow	CY	12,718	6.07	77,198			
36" RCP	LF	12	77.29	927			
48" RCP	LF	24	116.00	2,784			
24" RCP	LF	4	50.15	201			
18" RCP	LF	8	38.76	310			
42" RCP	LF	4	72.00	288			
54" RCP	LF	4	85.00	340			
Triple 10' x 5' Box	LF	4	1,642.00	6,568			
8' Box	LF	4	908.30	3,633			
Construction Subtotal				828,569			
Construction Markup at 38.57%				319,579			
Construction Total				1,148,148			
Right-of-Way from STP-164-1(39) of $9,530,800 (use 4% Reduction)				381,232			
Right-of-Way from STP-164-1(48) of $5,870,550 (use 4% Reduction)				232,302			
ROW Subtotal				613,534			
ROW Markup at 247.20%				INCL			
ROW Total				613,534			
Sub-total				1,761,682			
Mark-up at				INCL			
TOTAL				1,761,682			

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**37**
DESCRIPTION:	**USE 6-IN. THICK SHOULDERS INSTEAD OF FULL-DEPTH SHOULDERS**	SHEET NO.:	**1 of 4**

ORIGINAL DESIGN: (Sketch attached)

The current design calls for full-depth, 6.5-ft. shoulders for approximately 9,786 linear feet (LF) (Station (STA) 122+29 to STA 221+05) on both sides of SR 34 Bypass.

ALTERNATIVE: (Sketch attached)

Use 6-in. thick asphalt shoulders on top of the existing compacted material for the aforementioned 9,786 LF along SR34 Bypass.

ADVANTAGES:

- Reduces the amount of needed pavement
- Initial cost savings
- Full depth shoulders not needed

DISADVANTAGES:

- Not as durable
- Cannot be used as a full time driving lane

DISCUSSION:

Although acknowledging the rationale for the Department's desire to have full depth shoulders, this widening and reconstruction of the SR 34 Bypass is ,in fact, its future expansion negating the need for providing a travel lane for further future expansion. Minor repairs and short duration detours can be accommodated on the reduced thickness shoulders.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 1,513,758**	**—**	**$ 1,513,758**
ALTERNATIVE	**$ 978,467**	**—**	**$ 978,467**
SAVINGS	**$ 535,291**	**—**	**$ 535,291**

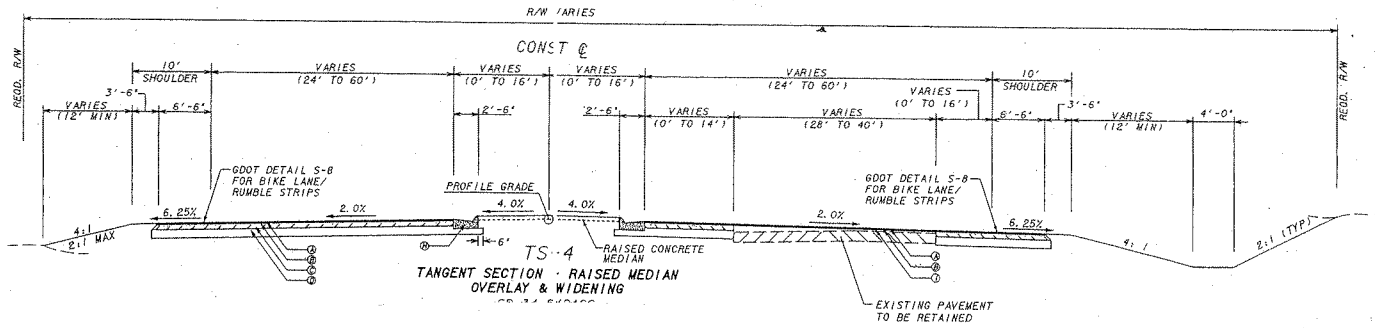
SKETCHES

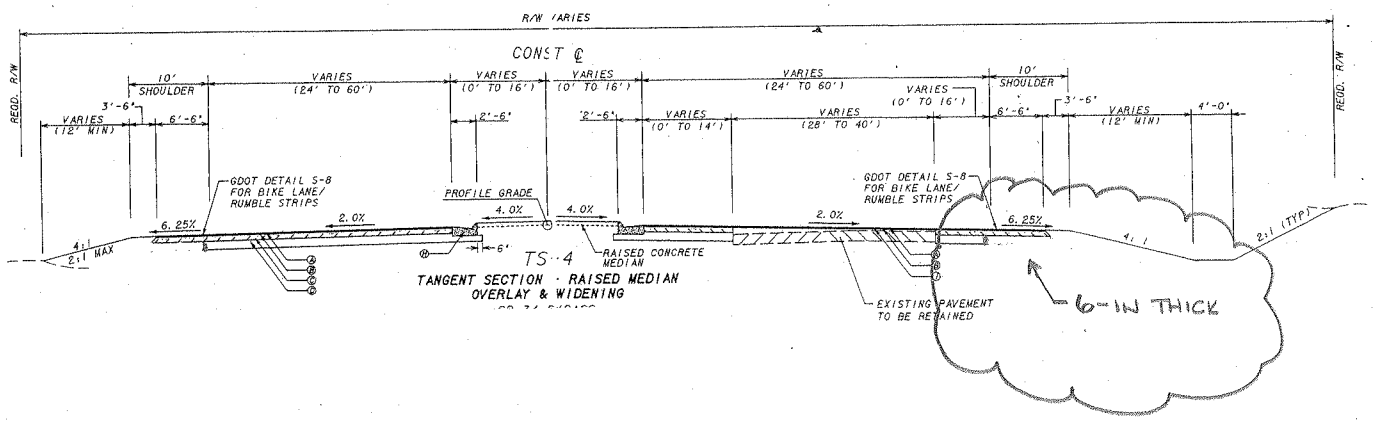
PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 37

☐ AS DESIGNED ☑ ALTERNATIVE

SHEET NO.: 2 of 4





CALCULATIONS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 37

SHEET NO.: 3 of 4

DESIGNED SHOULDER IS 6.5 FT ON EACH SIDE OF ROADWAY FROM STA 122+29 TO STA 221+05 ⇒ 9,876 LF.

9876 x 2 = 19752 LF
↖ BOTH SIDES OF ROADWAY

19752 LF x 6.5 FT = 128388 sf ÷ 9 = 14265 SY x $76.59/SY = $1,092,439

SHOULDER AT FULL DEPTH AS DESIGNED $1,092,439

2.5 MM SUPERPAVE – 990 #/SY ÷ 2000 #/TON x $100/TON = $49.50/SY

USING 6-INCH SHOULDERS

14265 SY x $49.50/SY = $706,119

COST WORKSHEET

PROJECT:	**STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
	Coweta County, Georgia Department of Transportation, District 3
	Final Design Stage
ALTERNATIVE NO:	**37**
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
Pavement	SY	14,265	76.58	1,092,414	14,265	49.50	706,118
	Sub-total			1,092,414			706,118
Mark-up at	**38.57%**			421,344			272,350
	TOTAL			1,513,758			978,467

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**38**
DESCRIPTION:	**REMOVE TAPER FROM THE BRIDGE OVER THE CSX RAILROAD**	SHEET NO.:	**1 of 1**

ORIGINAL DESIGN:

The bridge preliminary layout does not show any taper on the left side of the bridge at the Bent 4 end. The roadway plans (Sheet No. 13-34) show a taper on the left side beginning at Station 288+40.

ALTERNATIVE:

Move the beginning of the taper off of the bridge and the approach slab. Another, less desirable alternative is to show the taper on the bridge plans.

ADVANTAGES:

- Bridge plans match road plans
- Facilitates construction
- Avoids potential conflicts and contractor change order

DISADVANTAGES:

- None apparent

DISCUSSION:

The end of the bridge, at the inside face of the left parapet at Bent 4, is at Station 288+55.75 and the taper begins at station 288+40; therefore, approximately 16 ft. of the taper is on the bridge. It is easier to construct the bridge if there is no taper. If the taper cannot be moved off the bridge, it should be shown on the bridge plans.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	**DESIGN SUGGESTION**		
SAVINGS			

VALUE ENGINEERING ALTERNATIVE

PROJECT:	**STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO.:	**39**
DESCRIPTION:	**REMOVE THE EASTBOUND "U" TURN LANE AT HOSPITAL ROAD**	SHEET NO.:	**1 of 5**

ORIGINAL DESIGN: (Sketch attached)

The current design calls for a ±600-ft. long "U" turn lane eastbound on SR 34 Bypass at Hospital Road.

ALTERNATIVE: (Sketch attached)

Remove the "U" turn lane and associated items.

ADVANTAGES:

- Promotes limited access
- Initial cost savings
- Reduces traffic movements at intersection
- Improves safety
- "U" turn lane is not warranted

DISADVANTAGES:

- If in the future a development occurs to the north at this location, a left turn lane will probably need to be added

DISCUSSION:

It appears this "U" turn lane serves very few, if any, motorists – perhaps only those who inadvertently turn onto SR34 Bypass from SR 16/US 27/Temple Avenue.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	**$ 106,117**	**—**	**$ 106,117**
ALTERNATIVE	**$ 0**	**—**	**$ 0**
SAVINGS	**$ 106,117**	**—**	**$ 106,117**

COUNTY	PROJECT NUMBER
COWETA	STP-164-1(139) & STP-1

EXISTING

ALT 39

2 OF 5

18
N/F
ANDREW & PAUL WHITLOCK

EXIST. R/W & LA

ATLANTA GAS LIGHT EASEMENT

N/F
SAMPLE BROWN

160+00

N/F
SAMPLE BROWN

S. R. 34 BYPASS
STA. 163+59.29-
HOSPITAL RD.
STA. 20+00.00

18
N/F
ANDREW & PAUL

EXIST. R/W &

BEGIN TAPER
STA. 157+24.
34' LT

END TAPER
STA. 159+04.
38' LT

8 SY STONE
DUMPED RIPRAP
TYPE 3, 24"

BEGIN TAPER
STA. 161+67.
38' LT

END TAPER
BEGIN TAPER
STA. 162+67.
51' LT

END TAPER
BEGIN TAPER
STA. 163+17.
52' LT

BEGIN SPECIAL DITCH
STA. 162+26

18" SDP

F-1

PROPOSED
SIGNAL POLE

6.5' PAVED SHOULDER

6.5' PAVED SHOULDER

STA. 162+50
TYPE 1 ANCHOR
BEGIN W-BEAM GR.

F-2

18" SDP

24'

BEGIN TAPER
STA. 162+13.
14' LT

END TAPER
STA. 163+03.
16' LT

S 33°58' E

CONST. ℄

KC54

S. R. 34 BYPASS

CONST. ℄

BEGIN TAPER
STA. 156+63.
10' RT

STA. 157+90.00
END GRASS
MEDIAN
BEGIN CONCRETE
MEDIAN PAVING

END TAPER
STA. 159+03.
6' LT

PC 159+28.84

PT 159+89.07

BEGIN TAPER
STA. 62+13.
54' RT

6.5' PAVED SHOULDER

6.5' PAVED SHOULDER

18" SDP

BEGIN TAPER
STA. 157+24.
34' RT

EXIST. R/W & LA

NEWNAN CITY LIMITS

EXIST. R/W & LA

NEWNAN CITY LIMITS

END TAPER
STA. 162+56.
56' RT
48" RCP
36 SY STONE
DUMPED RIPRAP
TYPE 3, 24"

G-2

PROPOSED
SIGNAL POLE

END 6.5'
PAVED
SHOULDER
BEGIN 2'
PAVED
SHOULDER
163+32.96
143.29'

END TAPER
STA. 159+04.
54' RT

ATLANTA GAS LIGHT EASEMENT

NEWNAN CITY LIMITS

ATLANTA GAS LIGHT EASEMENT

15
N/F
SAMPLE BROWN

STA. 159+5
TYPE 12 ANCHOR
BEGIN W-BEAM GR.

15
N/F
SAMPLE BROWN

N/F
ANDREW & PAUL WHITLOCK

Curve Data
N - KC54
Δ - 0°40'44" (RT)
T - 29.62
L - 59.23
E - 0.09
R - 5000.00
PI STA - 159+59.46
PI X - 2098782.398
PI Y - 1236839.723
SE - NC

NEWNAN CITY LIMIT

ELA
162+71.00
143.40'

REQ'D. R/W

WDARY

OF ACCESS.....BLA
OF ACCESS.....ELA
ACCESS
IMIT OF ACCESS

20 0 20 40 60FT.
SCALE: 1" - 20'

REVISION DATES

STATE R/W LINE
DEPARTMENT
OFFICE: CONSUL
MAI & MAINT
S. R. F SLOPES
F DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
R/W AND LIMIT OF ACCESS

20 0
SCALE

COUNTY	PROJECT NUMBER
COWETA	STP-164-1(39) & STP-1

Proposed

ALT 39

3 of 5

18
N/F
ANDREW & PAUL WHITLOCK

EXIST. R/W & LA

ATLANTA GAS LIGHT EASEMENT

N/F
SAMPLE BROWN

COWETA 160+00

S. R. 34 BYPASS
STA. 163+59.29-
HOSPITAL RD.
STA. 20+00.00

18
N/F
ANDREW & PAUL

EXIST. R/W &

BEGIN TAPER
STA. 157+24.
34' LT

END TAPER
STA. 159+04.
38' LT

8 SY STONE
DUMPED RIPRAP
TYPE 3, 24"

BEGIN TAPER
STA. 161+67.
38' LT

END TAPER
BEGIN TAPER
STA. 162+67.
51' LT

END TAPER
BEGIN TAPER
STA. 163+17.
52' LT

BEGIN SPECIAL DITCH
STA. 162+26

18" SDP

F-1

PROPOSED
SIGNAL POLE

6.5' PAVED SHOULDER

6.5' PAVED SHOULDER

STA. 162+50
TYPE 1 ANCHOR
BEGIN W-BEAM GR.

F-2

24'

BEGIN TAPER
STA. 162+13.
14' LT

END TAPER
STA. 163+03.
16' LT

°33'58" E

CONST. ℄

KC54

S. R. 34 BYPASS

CONST. ℄

PC 159+29

PT 159+89.07

BEGIN TAPER
STA. 62+13.
54' RT

6.5' PAVED SHOULDER

RETAIN
20'

18" SDP

BEGIN TAPER
STA. 157+24.
34' RT

EXIST. R/W & LA

NEWNAN CITY LIMITS

EXIST. R/W & LA

NEWNAN CITY LIMITS

END TAPER
STA. 162+56.
56' RT
48" RCP

PROPOSED
SIGNAL POLE
END 6.5'
G-1 PAVED
SHOULDER
BEGIN 2'
PAVED
SHOULDER
163+32.96
143.29'

G-2

7.5' R

36 SY STONE
DUMPED RIPRAP
TYPE 3, 24"

ELA
162+71.00
143.46'

REQ'D. R/W

END TAPER
STA. 159+04.
54' RT

ATLANTA GAS LIGHT EASEMENT

NEWNAN CITY LIMITS

ATLANTA GAS LIGHT EASEMENT

15
N/F
SAMPLE BROWN

STA. 159+5
TYPE 12 ANCHOR
BEGIN W-BEAM GR.

15
N/F
SAMPLE BROWN

N/F
ANDREW & PAUL WHITLOCK

NEWNAN CITY LIMIT

NDARY

Curve Data
N = KC54
Δ = 0°40'44" (RT)
T = 29.62
L = 59.23
E = 0.09
R = 5000.00
PI STA = 159+59.46
PI X = 2098782.398
PI Y = 1236839.723
SE = NC

OF ACCESS	BLA
OF ACCESS	ELA
ACCESS	
IMIT OF ACCESS	

20 0 20 40 60FT.
SCALE: 1" = 20'

REVISION DATES

STA
DEPARTMEN
OFFICE: CONSUL
MAI
S. R

W LINE
& MAINT
F SLOPES
F DRIVES

BEGIN LIMIT OF ACCESS	BLA
END LIMIT OF ACCESS	ELA
LIMIT OF ACCESS	
R/W AND LIMIT OF ACCESS	

20 0
SCALI

CALCULATIONS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

ALTERNATIVE NO.: 39

SHEET NO.: 4 of 5

PAVEMENT REMOVED: (ASSUME FULL DEPTH)

$AREA_{LANE} \sim 600' \times 12' \times \frac{1}{9} = 800$ SY

$AREA_{WIDEN\ OUT} \sim 150' \times 12' \times \frac{1}{9} = 200$ SY

//

MEDIAN PAVEMENT VS. GRASS AS SHOWN.

ASSUME EVEN TRADE IN MONEY.

//

ALL OTHER ITEMS NEG.

//

RIGHT OF WAY → NO SAVINGS
SINCE INSIDE EXISTING R/W.

COST WORKSHEET

PROJECT:	**STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***	ALTERNATIVE NO: SHEET NO.:	**39** **5 of 5**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Full Depth Pavement	SY	1,000	76.58	76,580			
Sub-total				76,580			
Mark-up at	**38.57%**			29,537			
TOTAL				106,117			

PROJECT DESCRIPTION

NEED AND PURPOSE

The need for the widening of the SR 34 Bypass is that the Level of Service (LOS) will be at an undesirable level by the year 2029. The purpose of the widening and improvements would be to mitigate future congestion along the SR 34 Bypass and SR 34, which flows through downtown Newnan. By separating through and local traffic, there will be greater access to U.S. Interstate Highway 85 (I-85) from the towns and cities located west of Newnan such as Whitesburg and Franklin. This will serve to reduce the number of trucks driving through the downtown, as well as commuters traveling to I-85.

PROJECT LOCATION - Project STP-164-l(39) begins on the State Route (SR) 34 Bypass at County Road (CR) 70/Hospital Road (MP [Mile Post] 2.86) on existing location and continues easterly along the bypass 2.59 miles to its intersection with CR 912/Jefferson Parkway/Calumet Parkway (MP 5.45). Project STP-164-l(48) begins on the SR 34 Bypass at CR 912/Jefferson Parkway/Calumet Parkway (MP 5.45) on existing location and continues easterly along the bypass 0.58 miles to its intersection with SR 34/Bullsboro Road (MP 6.03). The original concept was for only STP-164-1(39), P. I. No. 322400, from Hospital Road to SR 34. Project STP-l64-1(48) was later split out as a local government project that was never completed.

PROJECT DESCRIPTION:

Description of the approved concept:

- PDP [Project Development Process] Classification: Major
- Federal Oversight: Exempt
- Functional Classification: Urban Connecting Link
- U.S. Route Number: N/A
- State Route Number: 34 Bypass
- Traffic (AADT [Average Annual Daily Traffic]): Current Year 1998 = 16,000; Design Year 2018 = 27,000

Proposed features to be revised: The features from the approved concept being revised are the typical section and the project termini. The original concept proposed widening the existing 2-lane to a 4-lane section with a 44-ft. depressed median from CR 70/Hospital Road (MP 2.86) east to SR 14/US 29/Jefferson Davis Memorial Highway (MP 3.85) and a 4-lane section with a 20 foot raised median from SR 14/US 29 to SR 34 (MP 6.03). The project length proposed was 3.17 miles.

Describe the revised feature(s) to be approved:

- Changes to the median type and typical section: In the approved concept, the typical section has a 44-ft. depressed median from CR 70 to SR 14. With this revision, the median in this section will be changed to a 20-24 ft. raised median with urban shoulders which widens to a 28 foot median width at cross road intersections to accommodate a similar type “B” median crossover. From CR 70/Hospital Road to SR 16 the raised median and urban shoulders will transition to match the existing SR 34 Bypass lanes and rural shoulders at SR 16, or match the Southwest Bypass if it extends to SR 16 also. The raised median from SR 16 to SR 34 will be 20 foot – 24 foot and transition to 28-ft. at intersections.

- Changes in the project termini: In the approved concept, project STP-164-1(39) begins at CR 70 and ends at SR 34. Project STP-l64-l(39) will now be from SR 16/US 27 Alt. [Alternate] Reverend Travis Henry Edison Highway (MP 2.0) to Jefferson Parkway/Calumet Parkway (MP5.45) for a length of 3.45 miles, and Project STP-164-1(48) will be from Jefferson Parkway (MP 5.45) to SR 34/Bullsboro Road (MP 6.03) for a length of 0.58 miles. Both projects will be developed as if a single project, as in the original Concept Report for a total length of 4.03 miles.
- Updated Functional Classification: Urban Principal Arterial
- Updated traffic data (AADT): Current Year 2010= 28,600; Design Year 2030 = 46,800
- Programmed / Schedule:
  - P. I. 322400 P.E. [Preliminary Engineering]: 1992; R/W [Right-of-Way]: 2006 Construction: 2009
  - P. I. 322405 P.E.: 1992; R/W: 2006; Construction: 2007
  - Both Projects Are Requested To Be Scheduled Concurrent
- Revised cost estimates:
  - Construction cost including inflation and E&C [Engineering and Construction].
  - Right-of-Way — current programmed costs were used.
  - Utilities updated cost has been requested.
- The project is located in a Non-Attainment area.

BACKGROUND

The proposed improvements entail the widening of the SR 34 Bypass (Newnan Bypass) from SR 34/Bullsboro Drive SR 16/Temple Avenue. This route is an existing bypass around the City of Newnan. A Coweta County planning study conducted in 1990 concluded that additional capacity would be required for this route prior to 1996 in order to maintain an acceptable level of service (LOS). The improvements have been separated into two projects, P. I. No. 322400 and P. I. No. 322405.

For P. I. No. 322400, the project limits are SR 34 Bypass from SR 16/Temple Avenue to Jefferson Parkway. The preliminary engineering phase of this project was authorized in 1992, the Right of Way phase is scheduled for 2006, and the construction phase is scheduled for 2009.

For P. I. No. 322405, the project limits are SR 34 Bypass from Jefferson Parkway and SR 34/Bullsboro Drive. The preliminary engineering is being performed in conjunction with P. I. No. 322400. The Right of Way phase is scheduled for 2006, and the construction phase is scheduled for 2007.

Existing Route Conditions - The existing roadway has two 12-ft. lanes with a 111-ft. x 44-ft. bridge over the CSX Railroad. The posted speed limit is 45 mph [miles per hour] along this route. The functional classification for the SR 34 Bypass within the scope of this project is Urban Principal Arterial. The percentage of trucks on the SR 34 Bypass is estimated at 5% until the intersection of Welcome Road on the west side of Newnan where the estimated percentage of trucks increases to 15%.

Proposed Improvements - The proposed project seeks to widen the SR 34 Bypass to four lanes with a raised median, sidewalk, curb and gutter and shoulders on both sides of the route.

Existing and Projected Traffic Conditions - LOS is defined as a qualitative measure describing operational conditions within a traffic stream. There are six identified LOS with letters “A” through “F.” LOS A represents the best operating conditions and LOS F represents the worst. LOS C is considered as

acceptable and marks the beginning of a range of traffic flows in which level of driving comfort declines noticeably on the roadway. LOS E represents at or near capacity for traffic flow. LOS F represents heavily congested flow with traffic demands exceeding capacity.

The annual daily traffic (ADT) for the SR 34 Bypass between SR 16/Temple Boulevard and Jefferson Parkway is 19,870. This indicates a LOS "C." The ADT is projected to be 24,400 in the year 2010, which would indicate a LOS "D". In the year 2030, ADT is projected to be 39,600 with a LOS "F". The proposed improvements would result in a LOS "B" with an ADT of 24,400 in the year 2010 and in the year 2030, the route would flow at a LOS "C" with an ADT of 39,600.

The ADT for the SR 34 Bypass between Jefferson Parkway and SR 16/Bullsboro Drive is 19,870. This indicates a LOS "C." The ADT is projected to be 28,600 in the year 2010, which would indicate a LOS "D." In the year 2030, ADT is projected to be 46,800 with a LOS "F." The proposed improvements would result in a LOS "B" with an ADT of 28,600 in the year 2010 and in the year 2030, the route would flow at a LOS 'D' with an ADT of 46,800,

Logical Termini - For the SR 34 Bypass: the western terminus is SR 34/Franklin Road where the SR 34 Bypass connects to SR 31 west of Newnan. The eastern terminus is SR 34/Bullsboro Drive. As a bypass around the City central business district (CBD), the route could serve to decrease the number of trucks and the traffic on SR 34 through the CBD. Currently, the percentage pf trucks on SR 34 headed west from 1-85 decreases from 5% to 2% as SR 34 intersects the SR 34 Bypass. On the east side of Newnan, the percentage of trucks increases from 2% to 15% west of the intersection of the SR 34 Bypass.

The logical termini for the individual projects are as follows: For P. I. No. 322400, the western terminus is SR 34/Franklin Road and the eastern terminus is SR 34/Bullsboro Drive. For P. I. No. 322405, the western terminus is SR 14/Roscoe Road where there is a significant decrease in the AADT by 31%. The eastern terminus is SR 34/Bullsboro Drive.

Project Linkage - The improvements to the SR 34 Bypass were split into two separate projects from the original concept plan due to a shortage in funding. P. I. No. 322400 extends to the west and P. I. No.322405 extends to the east. P. I. No. 322800 is located within the vicinity of and is and an extension of the same route, the Newnan Southwest Bypass.

Environmental Justice - This project does not appear to have a disproportionate effect on the environment for minorities, low income families, or the elderly population.

Land Use - The land use alone this route is primarily undeveloped with a limited number of commercial developments such as a car repair shop. In addition, there are minor industrial facilities located on the SR 34 Bypass between Werz Industrial Boulevard and SR 34/Bullsboro Drive.

Bike and Pedestrian Facilities - The SR 34 Bypass is identified in the Coweta County bicycle and pedestrian plan as a proposed route far bike lanes and appropriate facilities. There are no projects currently identified in the TIP [Transportation Improvement Program]/RTP [Regional Transportation Plan] for this route and it is not identified in the state bicycle and pedestrian network.

ACCIDENT DATA

A review of the accident and injury rates for P. I. No. 322400 shows that the accident rate on the SR 34 Bypass from SR 16/Temple Avenue to Jefferson Parkway is lower than the statewide average for years, 2000, 2001, and 2002. The injury rate was higher in the year 2000, but lower than the statewide average

in the years 2001 and 2002. The fatality rate was lower in 2000 and 2001, but was higher in the year 2002. The significant proportion of accidents occurred at the following locations: (1) the intersection of SR 70/Roscoe Road (11% in the year 2000, 12% in 2001, and 10% in 2002), (2) the intersection of Hillwood Circle (13% in 2000, 8% in 2001, and 8% in 2002), (3) the intersection of SR 14/Jackson Street (10% in 2000, 8% in 2001, and 8% in 2002), and (4) the intersection of Jefferson Parkway (6% in 2000, 13% in 2001, and 7% in 2002). The prominent types of accidents were rear end and angle collisions which is indicative of heavy congestion and/or significant turning movements along a roadway.

A review of the accident and injury rates for P. I. No. 322405 on the SR 34 Bypass from Jefferson Parkway to SR 34/Bullsboro Drive is higher than the statewide average for years, 2000, 2001, and 2002. The fatality rate was lower than the statewide average in all three years. The significant proportion of accidents occurred at the following locations: (10 the intersection of Jefferson Parkway (17% in the year 2001), (2) the intersection of Werz Industrial Boulevard (l8% in 2000, 19% in 2001, and 10% in 2002), and on the portion of roadway directly north of the intersection of SR 34/Bullsboro Drive (35% in 2000, 30% in 2001, and 32% in 2002). The prominent types of accidents along this route are rear end and angle collisions which is indicative of heavy congestion and/or significant turning movements along a roadway.

CONSTRUCTION COSTS

The probable cost of construction for STP-164-1(39), P. I. No. 3224400, project is based on Wolverton & Associates, Inc.'s undated cost estimate and is listed as $38,552,906. This figure is comprised of: (1) Construction Subtotal at $20,944,480, (2) Engineering and Construction (10.00%) at $2,094,480, (3) Inflation based on 8.00% per annum for three years (25.97%) at $5,983,210, and (4) Right of Way costs of $9,530,768.

The probable cost of construction for STP-164-1(48), P. I. No. 3224405, project is based on Wolverton & Associates, Inc.'s undated cost estimate and is listed as $10,543,667. This figure is comprised of: (1) Construction Subtotal at $3,417,927, (2) Engineering and Construction (10.00%) at $341,793, (3) Inflation based on 8.00% per annum for three years (25.97%) at $976,339, and (4) Right of Way costs of $5,807,548.

GDOT provided an inflation rate of 8.00% per annum based on recent historical data.

As such, the grand total for the combined projects is $49,096,573.

VALUE ANALYSIS AND CONCLUSIONS

GENERAL

This section describes the procedures used during the value engineering study. It is followed by separate narratives and conclusions concerning:

- Value Engineering Workshop Agenda
- Value Engineering Workshop Participants
- Economic Data
- Cost Estimate Summary and Cost Histograms
- Function Analysis
- Creative Idea Listing and Judgment of Ideas

A systematic approach was used in the VE study and the key procedures involved were organized into three distinct parts: 1) preparation; 2) VE workshop; and 3) post-study. A Task Flow Diagram that outlines each of the procedures included in the VE study is attached for reference.

PREPARATION EFFORT

Pre-study preparation for the VE effort consisted of scheduling study participants and tasks; gathering necessary background information on the facility; and compiling project data into a cost model and graphic cost histogram. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning operating needs, systems evaluations, basis of cost, soil conditions, and construction of the facility was also a part of the analysis.

VALUE ENGINEERING WORKSHOP EFFORT

The VE workshop was a three and a half-day effort (see attached agenda). During the workshop, the VE job plan was followed. The job plan guided the search for high cost areas in the project and included procedures for developing alternative solutions for consideration. It includes six phases:

- Information Phase
- Function Identification and Analysis Phase
- Speculation/Creative Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

Value Engineering Study Task Flow Diagram

Preparation Effort

Coordination Project
- Verify Schedule
- Suggest Format for Designer Presentation
- Outline Project Responsibilities
- Outline Needed Background Data
- Define *Project Value Objectives*
- Identify Project Constraints

→

Prepare for Workshop
- Collect Project Data
- Distribute Data to Team Members
- Team Members Become Familiar with Project

→

Construct Cost Models
- Construct Cost Models
- Construct Graphic Function Analysis
- Outline High Cost Areas

→

LCC Model
- Roadway
- Bridges
- MOT
- Energy
- User Impact

Workshop Effort

Information Phase
- Introduction by VETL
- Project Description and Presentation by Designer
- Outline Owner Requirements
- Review Project Data
- Visit Project Site (Alt.)

→

Function Identification and Analysis Phase
- Analyze Project Costs and Energy Usage
- Perform Function Analysis and FAST Diagram
- Identify High Cost and Energy Areas
- Calculate Cost/Worth Ratios
- Identify Paradigms

List Ideas Generated During Function Analysis

→

Speculation Phase
- Introduction by VETL
- Creative Idea Listing:
  - Quantity of ideas
  - Association of Ideas
- Brainstorm
- Do Creative Thinking
  - Group Thinking
  - Individual Thinking
- Use Checklist for Ideas

→

Evaluation Phase
- Eliminate Impractical Ideas
- Rank Ideas with Advantages/ Disadvantages
- Evaluate Alternatives
  (Include Non-Economic considerations: Safety, Reliability, Environment, Aesthetics, O&M, etc.)
- Select Best Ideas for Implementation

→

Development Phase
- Develop Proposed Alternatives
- Prepare Alternative Design Sketches
- Estimate Costs
- Perform Life Cycle Comparison
  - Initial Cost
  - Redesign Cost
  - O&M Cost
  - LCC Cost

→

Presentation Phase
- Summarize Findings
- Present VE Ideas to Owner/ User/Designer
- Oral Presentation

Post-Workshop Effort

VE Study Report
- Develop Implementation VE Report
- Designer Prepares Responses to VE Report
- Owner Evaluates Recommendations

→

Implementation Phase
- Participate in Implementation Meeting with Owner/User/ Designer/ VE Team, as needed
- Prepare Final VE Report

→

Final Acceptance
- Redesign by Designer

Information Phase

At the beginning of the study, the conditions and decisions that have influenced the development of the project must be reviewed and understood. For this reason, the development manager presented information about the project to the VE team on first day of the session. Following the presentation, the VE team discussed the project using the following documents:

- ***Revised Project Concept Report,*** Department of Transportation, State of Georgia, Office of Preconstruction for P. I. Nos. 322400 and 322405, Coweta County, Project Numbers STP-164-1(39) and (48), SR 32 Bypass Widening and Reconstruction; dated April 19, 2005;
- ***Approved Notice of Location and Design,*** Department of Transportation, State of Georgia, Office of Preconstruction for P. I. Nos. 322400 and 322405, Coweta County, Project Numbers STP-164-1(39) and (48), SR 32 Bypass; dated September 11, 2006;
- ***Half Size Drawings of Plan and Profile*** entitled Plan and Profile of Proposed S.R. 34 Bypass Widening and Reconstruction from S.R. 16/U.S. 27 to S.R. 34/Bullboro Drive ; Coweta County, Georgia; Federal Aid Project STP-164-1(39), STP-164-1(48); Federal Route No. N/A; State Route No. 34 Bypass; P. I. No. 322400 & 322405; prepared by the Wolverton & Associates, Inc. for the State of Georgia Department of Transportation; undated;
- ***Half Size Preliminary Bridge Layout*** entitled S.R. 34 Bypass Over C.S.X. Transportation, Inc.; Coweta County; STP-164-1(39); prepared by the Wolverton & Associates, Inc. for the State of Georgia Department of Transportation; dated March 2007;
- ***Half Size Plan and Elevation*** Bridge No. 1 for S.1424 Over A & 20 R.R.; Coweta County, P.R. 2177(4); prepared by the State of Georgia Department of Transportation; dated November 1974, Revised September 10, 1975 and April 5, 1978;
- ***General Highway Map***, Coweta County, Georgia, prepared by the Department of Transportation, Division of Planning and Programming, Office of information and Services in cooperation with the U.S. Department of Transportation, Federal Highway Administration, dated 1997;
- ***Traffic Engineering Report*** for Proposed Roadway Widening the SR 34 Bypass – SR 16 to SR 34, Coweta County, Georgia; prepared by Wolverton & Associates, Inc. for the Department of Transportation; GDOT Project No. STP-164-1(39) & STP-164-1(48), P. I. No. 322400 & 322405; W&A Project No. 05-900; dated August 5, 2005;
- ***Compact Disc***, titled: SR 34 Bypass Widening and Reconstruction project, Coweta County, Project No. STP-164-1(39) & STP-164-1(48), P. I. No. 322400 & 322405, Electronic Files containing DGN Design Files and Concept Displays prepared by Wolverton & Associates, Inc. for the VE Study; undated;
- ***Preliminary Right of Way Cost Estimate*** for project STP-164-1(39), Coweta, P. I. 322400, prepared by the State of Georgia Department of Transportation; dated December 15, 2005;
- ***Preliminary Right of Way Cost Estimate*** for project STP-164-1(48), Coweta, P. I. 322405, prepared by the State of Georgia Department of Transportation; dated December 15, 2005;
- ***Construction Cost Estimate*** for SR 34 Bypass, STP-164-1(39), 322400; undated;
- ***Construction Cost Estimate*** for SR 34 Bypass, STP-164-1(48), 322405; undated;
- ***Pavement Evaluation and Pavement Design Recommendations*** for STP-164-1(39) and STP-164-1(48), Coweta County, P. I. 322400 & 322405; Office of Materials and Research; dated June 20, 2006.

Function Identification and Analysis Phase

Based on historical and background data, a cost model and graphic function analysis were developed for this project by major construction elements. They were used to distribute costs by project element; serve as a basis for alternative functional categorization; and to assign worth to the categories, where worth is the least cost to provide the required function, as determined by the VE team. The VE team identified the functions of the various project elements and subsystems by using random function generation techniques resulting in the attached Random Function Analysis worksheets and Function Analysis Systems Technique (F.A.S.T.) diagram.

Speculation/Creative Phase

This VE study phase involved the creation and listing of ideas. Creative idea worksheets were organized by project element. During this phase, the VE team developed as many ideas as possible to provide the necessary functions within the project at a lower cost to the owner, or to improve the quality of the project. Judgment of the ideas was restricted at this point. The VE team was looking for a large quantity of ideas and association of ideas.

GDOT and representatives from Wolverton & Associates, Inc. may wish to review the creative list since it may contain ideas that can be further evaluated for potential use in the design.

Evaluation Phase

During this phase of the workshop, the VE team judged the ideas generated during the creative phase. Advantages and disadvantages of each idea were discussed to find the best ideas for development. Ideas found to be irrelevant or not worthy of additional study were discarded. Those that represented the greatest potential for cost savings or improvement to the project were then developed further.

The VE team would like to develop all ideas, but time constraints usually limit the number that can be developed. Therefore, each idea was compared with the present schematic design concepts, in terms of how well it met the design intent. Advantages and disadvantages were discussed, and each team member rated the ideas on a scale of zero to five, with the best ideas rated five. Total scores were summed for each idea and only highly-rated ideas were developed into alternatives. In cases where there was little cost impact, but an improvement to the project was anticipated, the designation DS, for design suggestion, was used. The design team should review this listing for possible incorporation of ideas into the project.

The creative listing was re-evaluated frequently during the process of developing alternatives. As the relationship between creative ideas became more clearly defined, their importance and ratings may have changed, or they may have been combined into a single alternative. For these reasons, some of the originally high-rated items may not have been developed into alternatives.

Development Phase

During the development phase, each highly rated idea was expanded into a workable solution. The development consisted of a description of the alternative, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed alternatives. Each alternative was written with a brief narrative to compare the original design to the proposed change.

Sketches and design calculations, where appropriate, were also prepared in this part of the study. The VE alternatives are included in the section entitled Study Results.

Presentation Phase

The last phase of the VE study was the presentation of the findings. The VE alternatives were screened by the VE team before draft copies of the Summary of Potential Cost Savings worksheets were provided to GDOT and Wolverton & Associates, Inc. representatives during an informal oral presentation on the last day of the study. The VE alternatives were arranged in the same order as the idea listing sheets to facilitate cross-referencing.

POST-WORKSHOP EFFORT

The post-study portion of the VE study includes the preparation of this Value Engineering Study Report. Personnel from GDOT and Wolverton & Associates, Inc. will analyze each alternative and prepare a short response, recommending either incorporating the alternative into the project, offering modifications before implementation, or presenting reasons for rejection. Lewis & Zimmerman Associates, Inc. is available at your convenience as you review the alternatives. Please do not hesitate to call on us for clarification or further information as you consider an implementation approach.

VALUE ENGINEERING STUDY AGENDA

Lewis & Zimmerman Associates, Inc. (LZA) will conduct a 28-hour Value Engineering (VE) study on the following projects: **STP-164-1(39), P. I. No. 322400 and STP-164-1(48), P. I. No. 322405, State Route (SR) 34 Bypass Widening and Reconstruction** from SR 16/U.S. Route (US) 27 to SR 34/Bullsboro Drive. The project is located in the Coweta County, Georgia. It is expected the owner, the Georgia Department of Transportation (GDOT) and the design consultant, Wolverton & Associates will be available to make a formal presentation concerning the project at the beginning of the workshop and be available to answer questions during the VE study effort.

VE Study Agenda

The VE study will follow the outline described below and be conducted March 19 – 22, 2007. The study will be conducted in the Engineering Services' Conference Room, Room 264 of GDOT's General Office located at No. 2 Capitol Square Street, Atlanta, Georgia 30334. The point-of-contact is Ms. Lisa L. Myers, Design Review Engineer Manager, and Value Engineering Coordinator, who can be reached at 404-651-7468.

Monday, March 19th

9:00 am – 9:15 am **General Introduction of all Parties and review of the VE Process**

9:15 am - 11:15 am **Owner's / Designer's Presentation**

GDOT and Wolverton & Associates are to present information concerning the projects including, but not necessarily limited to: rationale for design, criteria for specific areas of study, project constraints, and the reasons for design decisions.

11:15 am - 12:00 noon **Commence Function Analysis Phase**

The VE team will continue their familiarization with the cost models and project data for each area of study. The cost model(s) will be refined, as necessary; define the function of each project element or system in the cost model, select the primary or basic functions, and determine the worth, or least cost, to provide the function. Cost/worth or value index ratios will be calculated, and high cost/low worth areas for study identified. In addition, the VE team will continue defining the function of each element / system to gain a thorough understanding of the project's needs and requirements.

12:00 noon - 1:00 pm **Lunch**

1:00 pm - 5:00 pm **Conclude the Function Analysis Phase and Commence the Creative Phase**

The VE team will conduct a brainstorming session and list as many ideas as possible for consideration. The aim is to obtain a large quantity of ideas through free association, by eliminating roadblocks to creativity and deferring judgment.

Tuesday, March 20th

8:30 am - 10:00 am **Conclude Creative Phase and Complete Evaluation / Analytical Phase**

The VE team will analyze the ideas listed in the creative phase and select the best ideas for further development.

10:00 am - 12:00 noon **Development Phase**

VE team will develop creative ideas into alternate design solutions. Initial and life cycle cost estimates comparing original and proposed alternatives will be prepared. Selected alternatives for change will be developed and supported with sketches, calculations and written substantiation.

12:00 noon - 1:00 pm **Lunch**

1:00 pm - 5:00 pm **Continue Development Phase**

Wednesday, March 21st

8:30 am - 12:00 am **Continue Development Phase**

12:00 noon - 1:00 pm **Lunch**

1:00 pm - 4:00 pm **Conclude Development Phase**

4:00 pm – 5:00 pm **Commence Summary Worksheets for Information oral Presentation**

Upon completion of the Development Phase, the VE facilitator will commence preparation of the summary worksheets based on the alternatives developed by the VE team. The summary worksheets will form the basis of the informal oral presentation.

Thursday, March 22nd

8:00 am - 9:00 am **Finalize Summary Worksheets and Prepare for Oral Presentation Strategies**

9:00 am – 11:00 am **Informal Oral Presentation**

The VE team presents its alternatives to the owner and design team representatives and is available to clarify any points. The process for accepting / rejecting VE alternatives is described and a target schedule for meeting to finalize implementation decisions is established.

11:00 am **Adjourn**

VALUE ENGINEERING WORKSHOP PARTICIPANTS

The VE team was organized to provide specific expertise on the unique project elements involved. Team members consisted of a multidisciplinary group with professional design experience and a working knowledge of VE procedures. The VE team included the following professionals:

John P. Tiernan, PE	Bridge Engineer	ARCADIS
Dion B. Moten, PE	Construction Specialist / Transportation Engineer	Delon Hampton and Associates
J. Daniel Hood, PE	Roadway Engineer	HNTB
Luis M. Venegas, PE, CVS	Value Engineering Facilitator	Lewis & Zimmerman Associates, Inc.

OWNER/DESIGNER PRESENTATION

GDOT and Wolverton & Associates, Inc., presented an overview of the projects on Monday, March 19, 2007. The purpose of this meeting, in addition to being an integral part of the Information Gathering Phase of the VE Study, was to bring the VE team "up-to-speed" regarding the overall project. Additionally, the meeting afforded the design team the opportunity to highlight in greater detail, those areas of the project requiring additional or special attention.

VALUE ENGINEERING TEAM'S PRESENTATION

The VE team conducted an informal presentation on Thursday, March 22, 2007 to GDOT representatives where copies of the draft Summary of Potential Cost Savings worksheets were provided for interim use by GDOT and Wolverton & Associates, Inc. personnel.

A copy of the meeting participants is attached for reference.

VALUE ENGINEERING ATTENDEES

MEETING PARTICIPANTS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***		Date: **March 19 – 22, 2007**
NAME & E-MAIL (PLEASE PRINT)	**ORGANIZATION/TITLE**	**PHONE/FAX**
Name: Lyn Clements GDOT Employee No.: em: lyn.clements@dot.state.ga.us	Organization: State of Georgia Department of Transportation (GDOT), Office of Bridge Design Title: Assistant Bridge Design Group Leader	ph: 404-656-5289 cell: fx: 404-657-7671
Name: Kenneth (Ken) D. Crabtree, Jr. GDOT Employee No.: em: ken.crabtree@dot.state.ga.us	Organization: GDOT, District 3 Construction Title: Assistant District Construction Engineer	ph: 706-646-6572 cell: 706-741-3448 fx: 706-646-6584
Name: Marc Mastronardi GDOT Employee No.: em: marc.mastronardi@dor.state.ga.us	Organization: GDOT, Office of Construction Title: Construction Liaison	ph: 404-656-5306 cell: fx: 404-657-0783
Name: Gerald (Jerry) A. Milligan GDOT Employee No.: em: jerry.milligan@dot.state.ga.us	Organization: GDOT, Office of Right of Way Title: Supervisor Appraisal Estimator	ph: 770-986-1541 cell: fx: 770-986-1558
Name: Lisa L. Myers GDOT Employee No.: em: lisa.myers@dot.state.ga.us	Organization: GDOT, Engineering Services Title: Design Review Engineer Manager, Value Engineering Coordinator	ph: 404-651-7468 cell: fx: 404-463-6131
Name: Amber Leigh Perkins GDOT Employee No.: em: amber.perkins@dot.state.ga.us	Organization: GDOT, Office of Environmental / Location Title: NEPA Planner	ph: 404-699-3473 cell: fx: 404-699-4440
Name: Rick Reasons GDOT Employee No.: em: rick.reasons@dot.state.ga.us	Organization: GDOT, Office of Consultant Design Title: Design Group Manager	ph: 404-463-3832 cell: fx: 404-463-6136
Name: Harvard Seldon GDOT Employee No.: em: harvard.seldon@dot.state.ga.us	Organization: GDOT, District 3 Construction Title: Area Engineer	ph: 706-845-4115 cell: fx: 706-845-4310
Name: Brian K. Summers, PE GDOT Employee No.: em: brian.summers@dot.state.ga.us	Organization: GDOT, Engineering Services Title: Project Review Engineer	ph: 404-656-6846 cell: fx: 404-463-6131
Name: Ken Werho GDOT Employee No.: em: ken.werho@dot.state.ga.us	Organization: GDOT, Office of Traffic Safety and Design Title: Design Review Engineer	ph: 404-635-8144 cell: fx: 404-635-8116

VALUE ENGINEERING ATTENDEES

MEETING PARTICIPANTS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION** ***Coweta County, Georgia Department of Transportation, District 3*** ***Final Design Stage***		Date: **March 19 – 22, 2007**
NAME & E-MAIL (PLEASE PRINT)	**ORGANIZATION/TITLE**	**PHONE/FAX**
Name: Ron Wishon GDOT Employee No.: em: ron.wishon@dot.state.ga.us	Organization: GDOT, Engineering Services Title: Assistant Project Review Engineer	ph: 404-651-7470 cell: fx: 404-463-6131
Name: Chris Haggard, PE GDOT Employee No.: em: chris.haggard@wolverton-assoc.com	Organization: Wolverton & Associates, Inc. Title: Project Manager	ph: 770-447-8999 cell: fx: 770-447-9070
Name: Joseph (Joe) R. Macrina, PE GDOT Employee No.: em: joe.macrina@wolverton-assoc.com	Organization: Wolverton & Associates, Inc. Title: Principal in Charge	ph: 770-447-8999 cell: fx: 770-447-9070
Name: John P. Tiernan, PE GDOT Employee No.: em: john.tiernan@arcadis-us.com	Organization: ARCADIS Title: Senior Bridge Engineer	ph: 770-431-8666 cell: fx: 770-435-2666
Name: Dion B. Moten, PE GDOT Employee No.: em: dmoten@delonhampton.com	Organization: Delon Hampton & Associates, Chartered Title: Traffic Engineer	ph: 404-524-8030 cell: 404-895-1354 fx: 404-524-2575
Name: J. Daniel Hood, PE GDOT Employee No.: em: jhood@hntb.com	Organization: HNTB Title: Roadway Engineer	ph: 404-946-5734 cell: fx: 404-841-2820
Name: Luis M. Venegas, PE, CVS-Life, LEED® AP GDOT Employee No.: em: lvenegas@lza.com	Organization: Lewis & Zimmerman Associates, Inc. Title: Value Engineering Facilitator	ph: 770-992-3032 cell: 678-488-4287 fx: 77-435-2666
Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:
Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:
Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:

ECONOMIC DATA

The VE team developed economic criteria to evaluate the information gathered from the State of Georgia Department of Transportation and the Wolverton & Associates, Inc. To express costs in a meaningful manner, the VE team alternatives are presented on the basis of discounted present worth. Criteria for planning project period interest rates are based on the following parameters:

Year of Analysis:	2007
Construction Start Up:	±2008
Construction Duration:	±30 Months (2011)
Economic Planning Life: Economic Planning Life:	35 years for Pavement 50 years for Bridges
Discount Rate/Interest:	2.50% (Extrapolated from latest United States Office of Management and Budget Circular A-94, Appendix C – January 2007)
Inflation/Escalation Rate:	8.00% (Per GDOT)
Uniform Present Worth (UPW) Factor:	23.1452 for 35 years 28.3623 for 50 years
Cost of Power:	$0.07/kWHr (kilowatt hour) (assumed)
Operation and Maintenance Costs *(Industry Norms)*:	
Equipment - With Many Moving Parts	5.00%-5.50%+ of Capital Cost
Equipment - With Minimal Moving Parts	3.50%-4.00% of Capital Cost
Equipment - Electronic	3.00% of Capital Cost
Structural	1.00%-2.00% (or less) of Capital Cost
Composite Mark-Up for Construction: *(Composed of: Engineering and Construction at 10.00% and Inflation (based on 8.00% per annum for 3 years) at 25.97%.)*	38.57% (1.3857)
Composite Mark-Up (Right-of-Way): *(Composed of: Scheduling Contingency at 55.00%; Administration / Court Costs at 60.00%; and Inflation Factor at 40.00 %.)*	247.20% (2.4720)

COST ESTIMATE SUMMARY AND COST HISTOGRAMS

The VE team prepared several cost models for the project that follow this page. The cost models are arranged in the Pareto Charting/Cost Histogram format to aid in identifying high cost areas and are based on the *SR 34 Bypass/STP-164-1(39) 322400* and *SR 34 Bypass/STP-164-1(48)/322405* construction cost estimates prepared by Wolverton & Associates, Inc. As can be expected, judgments at this stage of the study are based on experience and intuition rather than facts, which are not uncovered until well along in the analysis of function. As a result of these qualified hypotheses, there appears to be a potential for initial savings in the following areas:

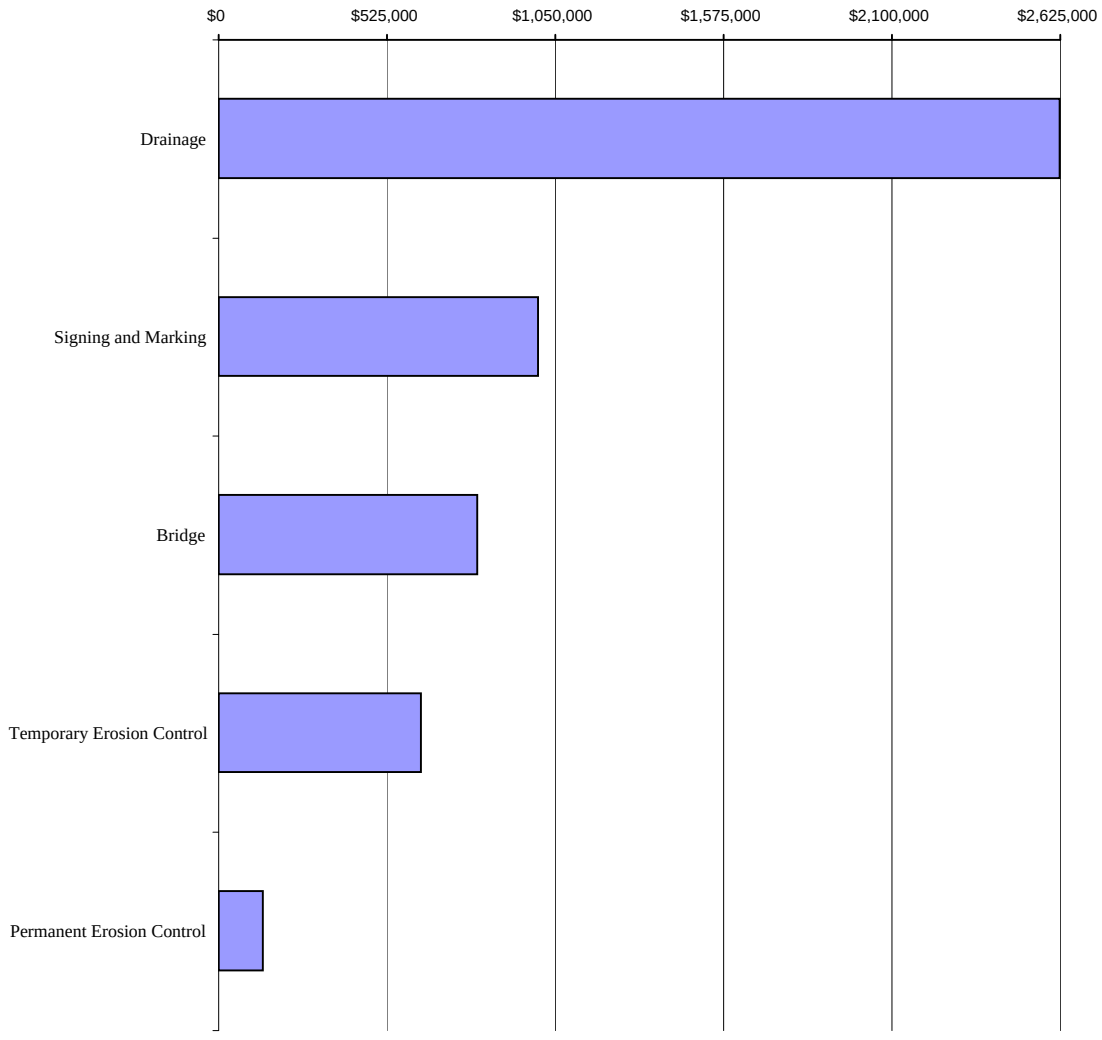
- Roadway Items
  - Recycled Asphaltic Concrete
  - GR Aggregate Base Course
  - Borrow Excavation
- Drainage
  - Storm Piping
  - Catch Basin
  - Drop Inlets
- Right-of-Way
  - Land
  - Damages
  - Improvements
  - Relocations

DESIGNER'S COST ESTIMATE

The cost estimate, as described above, did contain sufficiently detailed information to perform a VE when considering the current preliminary design stage.

COST HISTOGRAM

TOTAL PROJECT - SR 34 BYPASS WIDENING AND RECONSTRUCTION		COST	PERCENT	CUM. PERCENT
Roadway		19,170,004	78.69%	78.69%
Drainage		2,623,394	10.77%	89.46%
Signing and Marking		995,361	4.09%	93.54%
Bridge		806,400	3.31%	96.85%
Temporary Erosion Control		630,504	2.59%	99.44%
Permanent Erosion Control		136,744	0.56%	100.00%
Construction Subtotal		**$ 24,362,407**	**100.00%**	
Engineering and Construction at	10.00%	$ 2,436,241		
Inflation Based on 8.00%* per annum for Three Years	25.97%	$ 6,959,609	**Construction**	
Construction Total		**$ 33,758,257**	Mark-Up:	38.57%
Right-of-Way Costs; STP-164-1(38)		$ 2,745,037		
Right-of-Way Costs; STP-164-1(48)		$ 1,672,681		
Right-of-Way Subtotal		$ 4,417,718		
Scheduling Contingency	55.00%	$ 2,429,745		
Administration / Court Costs	60.00%	$ 4,108,478		
Inflation Factor	40.00%	$ 4,382,376	**ROW**	
Right-of-Way Total		**$ 15,338,317**	Mark-Up:	247.20%
GRAND TOTAL		**$ 49,096,573**		



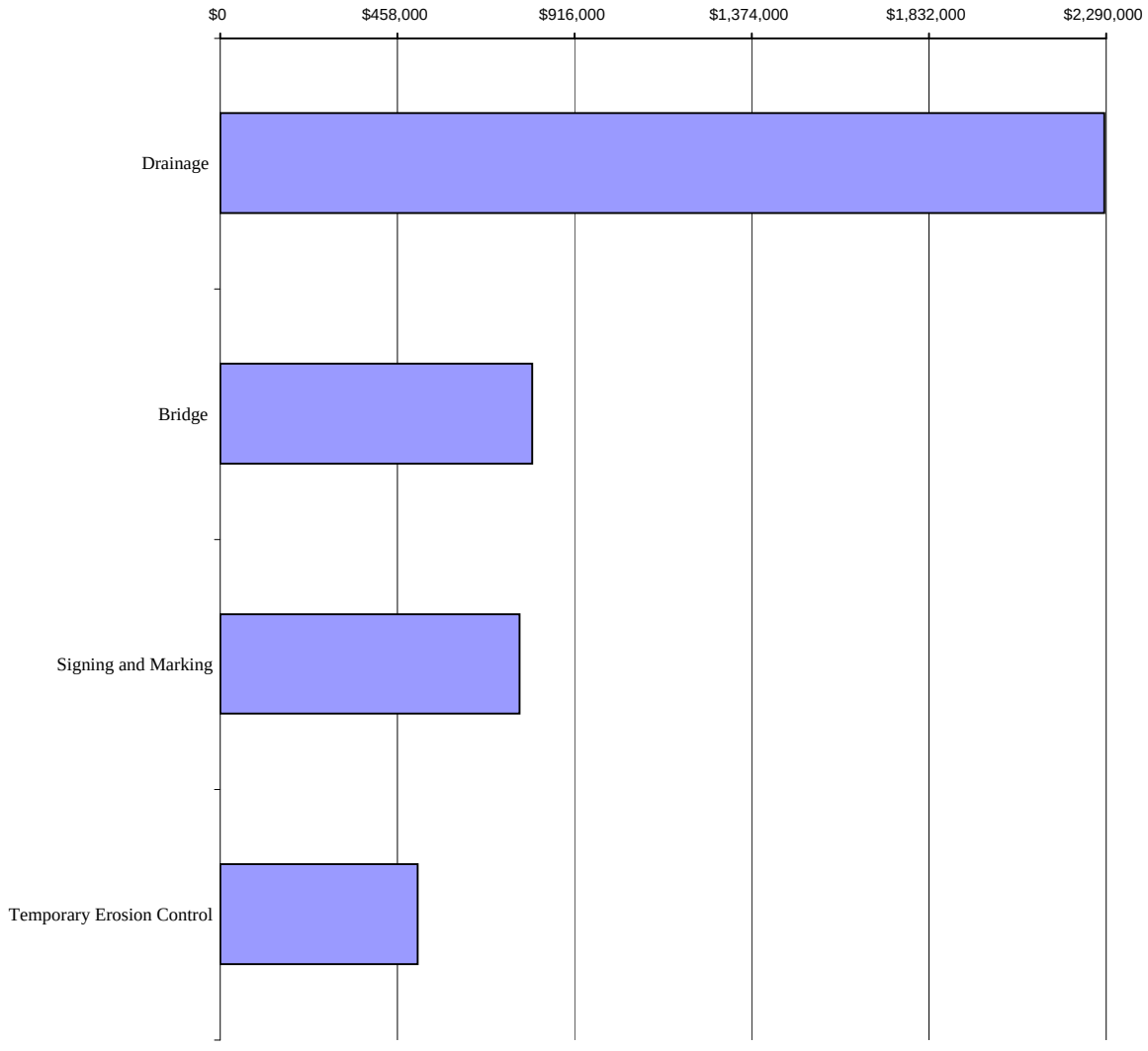
Costs in graph are not marked-up and does not include "Roadway Items."

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(39)		COST	PERCENT	CUM. PERCENT
Roadway		16,453,734	78.56%	78.56%
Drainage		2,285,014	10.91%	89.47%
Bridge		806,400	3.85%	93.32%
Signing and Marking		773,828	3.69%	97.01%
Temporary Erosion Control		509,904	2.43%	99.45%
Permanent Erosion Control		115,600	0.55%	100.00%
Construction Subtotal		**$ 20,944,480**	**100.00%**	
Engineering and Construction at	10.00%	$ 2,094,448		
Inflation Based on 8.00%* per annum for Three Years	25.97%	$ 5,983,210	**Construction**	
Construction Total		**$ 29,022,138**	Mark-Up:	38.57%
Right-of-Way Costs		$ 2,745,037		
Scheduling Contingency	55.00%	$ 1,509,770		
Administration / Court Costs	60.00%	$ 2,552,884		
Inflation Factor	40.00%	$ 2,723,077	**ROW**	
Right-of-Way Total		**$ 9,530,768**	Mark-Up:	247.20%
GRAND TOTAL		**$ 38,552,906**		



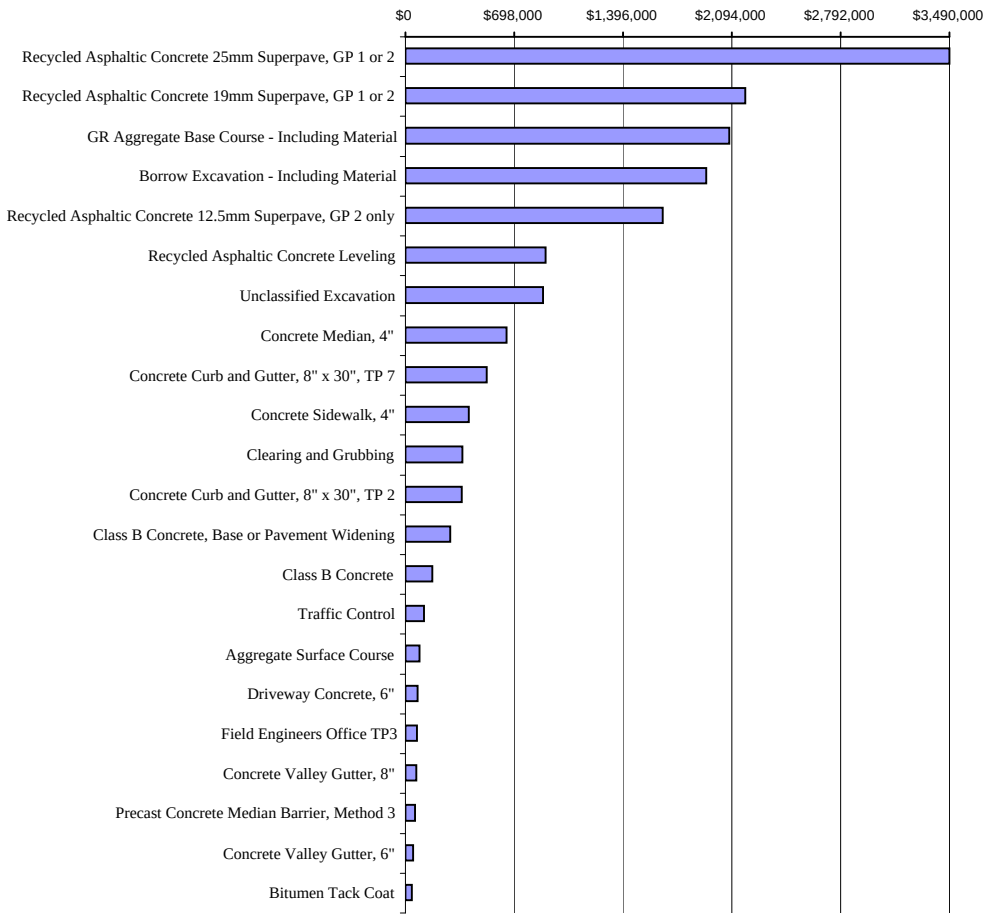
Costs in graph are not marked-up and does not include "Roadway."

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(39) - Roadway	COST	PERCENT	CUM. PERCENT
Recycled Asphaltic Concrete 25mm Superpave, GP 1 or 2	3,490,000	21.21%	21.21%
Recycled Asphaltic Concrete 19mm Superpave, GP 1 or 2	2,180,000	13.25%	34.46%
GR Aggregate Base Course - Including Material	2,075,820	12.62%	47.08%
Borrow Excavation - Including Material	1,929,817	11.73%	58.81%
Recycled Asphaltic Concrete 12.5mm Superpave, GP 2 only	1,650,000	10.03%	68.84%
Recycled Asphaltic Concrete Leveling	900,000	5.47%	74.31%
Unclassified Excavation	882,840	5.37%	79.67%
Concrete Median, 4"	649,030	3.94%	83.62%
Concrete Curb and Gutter, 8" x 30", TP 7	520,864	3.17%	86.78%
Concrete Sidewalk, 4"	407,520	2.48%	89.26%
Clearing and Grubbing	364,000	2.21%	91.47%
Concrete Curb and Gutter, 8" x 30", TP 2	360,800	2.19%	93.67%
Class B Concrete, Base or Pavement Widening	286,890	1.74%	95.41%
Class B Concrete	171,235	1.04%	96.45%
Traffic Control	117,300	0.71%	97.16%
Aggregate Surface Course	91,260	0.55%	97.72%
Driveway Concrete, 6"	77,180	0.47%	98.19%
Field Engineers Office TP3	75,834	0.46%	98.65%
Concrete Valley Gutter, 8"	69,902	0.42%	99.07%
Precast Concrete Median Barrier, Method 3	61,200	0.37%	99.44%
Concrete Valley Gutter, 6"	51,142	0.31%	99.76%
Bitumen Tack Coat	40,200	0.24%	100.00%
Construction Subtota	**$ 16,452,834**	**100.00%**	
Engineering and Construction at 10.00%	$ 1,645,283		
Inflation Based on 8.00%* per annum for Three Years 25.97%	$ 4,700,081	**Constructior**	
Construction Tota	**$ 22,798,198**	Mark-Up:	38.57%



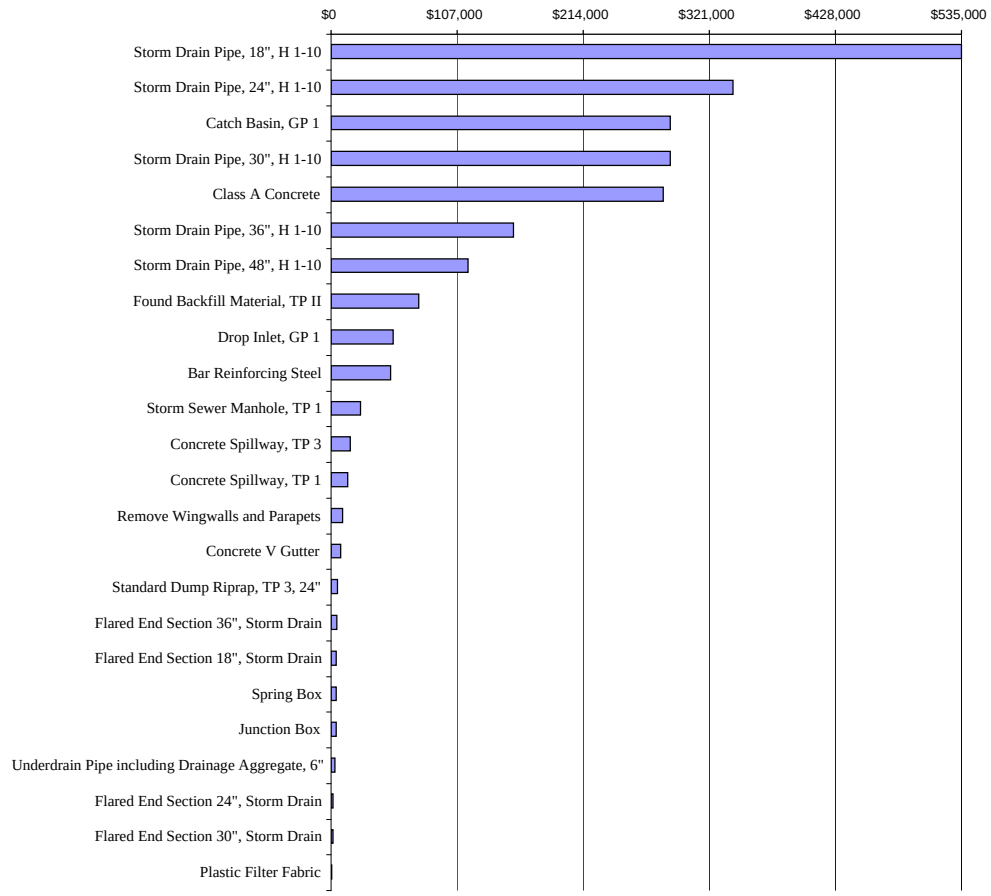
Costs in graph are not marked-up and does not include.

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(39) - Drainage	COST	PERCENT	CUM. PERCENT
Storm Drain Pipe, 18", H 1-10	534,888	23.41%	23.41%
Storm Drain Pipe, 24", H 1-10	341,020	14.92%	38.33%
Catch Basin, GP 1	288,127	12.61%	50.94%
Storm Drain Pipe, 30", H 1-10	287,776	12.59%	63.54%
Class A Concrete	281,658	12.33%	75.86%
Storm Drain Pipe, 36", H 1-10	154,580	6.76%	82.63%
Storm Drain Pipe, 48", H 1-10	116,000	5.08%	87.70%
Found Backfill Material, TP II	74,580	3.26%	90.97%
Drop Inlet, GP 1	52,931	2.32%	93.28%
Bar Reinforcing Steel	50,463	2.21%	95.49%
Storm Sewer Manhole, TP 1	24,745	1.08%	96.58%
Concrete Spillway, TP 3	16,508	0.72%	97.30%
Concrete Spillway, TP 1	13,950	0.61%	97.91%
Remove Wingwalls and Parapets	10,000	0.44%	98.35%
Concrete V Gutter	8,230	0.36%	98.71%
Standard Dump Riprap, TP 3, 24"	5,377	0.24%	98.94%
Flared End Section 36", Storm Drain	4,658	0.20%	99.15%
Flared End Section 18", Storm Drain	4,175	0.18%	99.33%
Spring Box	4,170	0.18%	99.51%
Junction Box	4,081	0.18%	99.69%
Underdrain Pipe including Drainage Aggregate, 6"	3,292	0.14%	99.83%
Flared End Section 24", Storm Drain	1,692	0.07%	99.91%
Flared End Section 30", Storm Drain	1,543	0.07%	99.98%
Plastic Filter Fabric	570	0.02%	100.00%
Construction Subtotal	**$ 2,285,014**	**100.00%**	
Engineering and Construction at 10.00%	$ 228,501		
Inflation Based on 8.00%* per annum for Three Years 25.97%	$ 652,760	**Construction**	
Construction Total	**$ 3,166,275**	Mark-Up:	38.57%



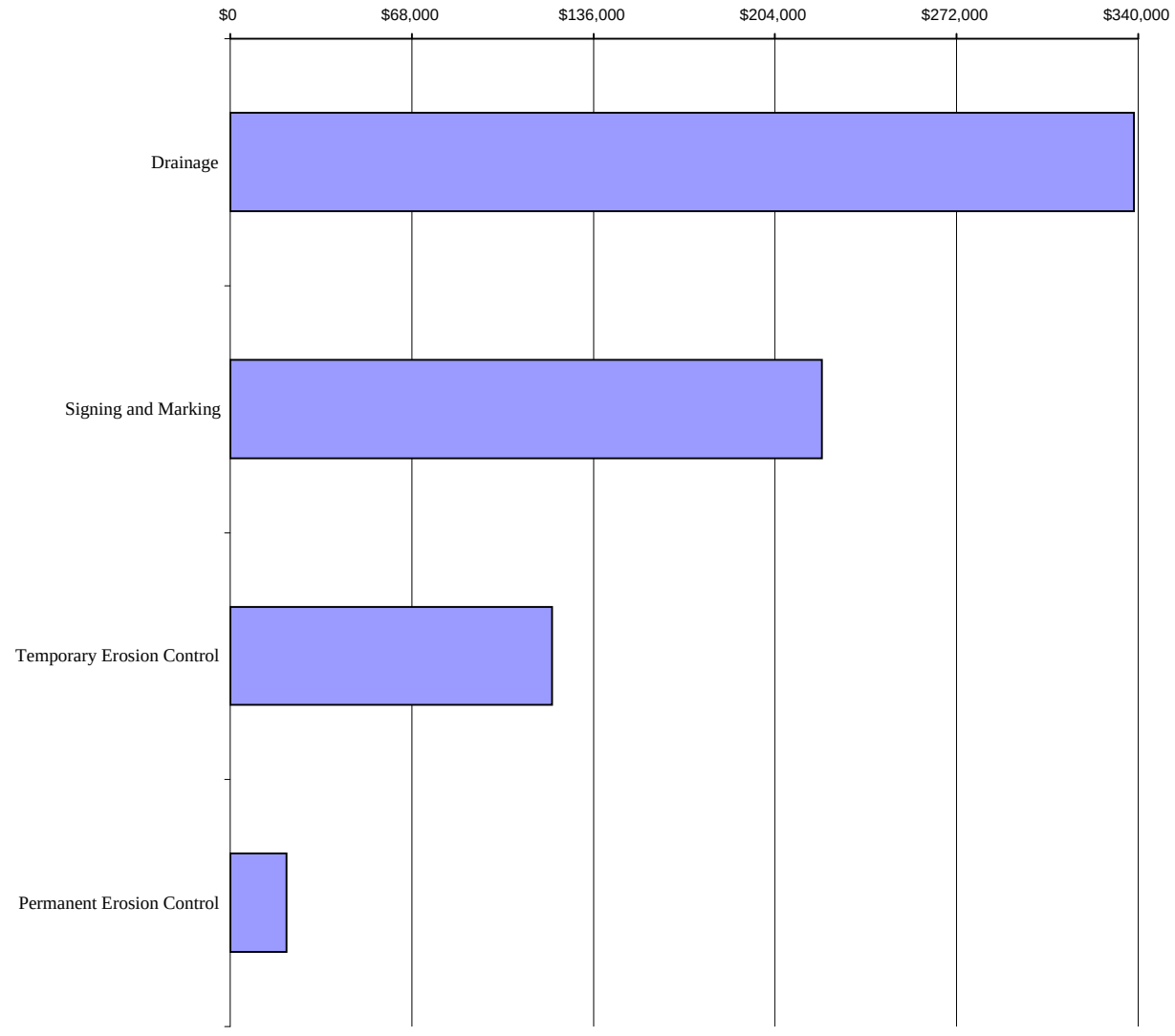
Costs in graph are not marked-up and does not include.

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(48)			COST	PERCENT	CUM. PERCENT
Roadway			2,716,270	79.47%	79.47%
Drainage			338,380	9.90%	89.37%
Signing and Marking			221,533	6.48%	95.85%
Temporary Erosion Control			120,600	3.53%	99.38%
Permanent Erosion Control			21,144	0.62%	100.00%
Construction Subtotal		$	**3,417,927**	**100.00%**	
Engineering and Construction at	10.00%	$	341,793		
Inflation Based on 8.00%* per annum for Three Years	25.97%	$	976,399	**Construction**	
Construction Total		$	**4,736,119**	Mark-Up:	38.57%
Right-of-Way Costs		$	1,672,681		
Scheduling Contingency	55.00%	$	919,975		
Administration / Court Costs	60.00%	$	1,555,593		
Inflation Factor	40.00%	$	1,659,300	**ROW**	
Right-of-Way Total		$	**5,807,548**	Mark-Up:	247.20%
GRAND TOTAL		$	**10,543,667**		



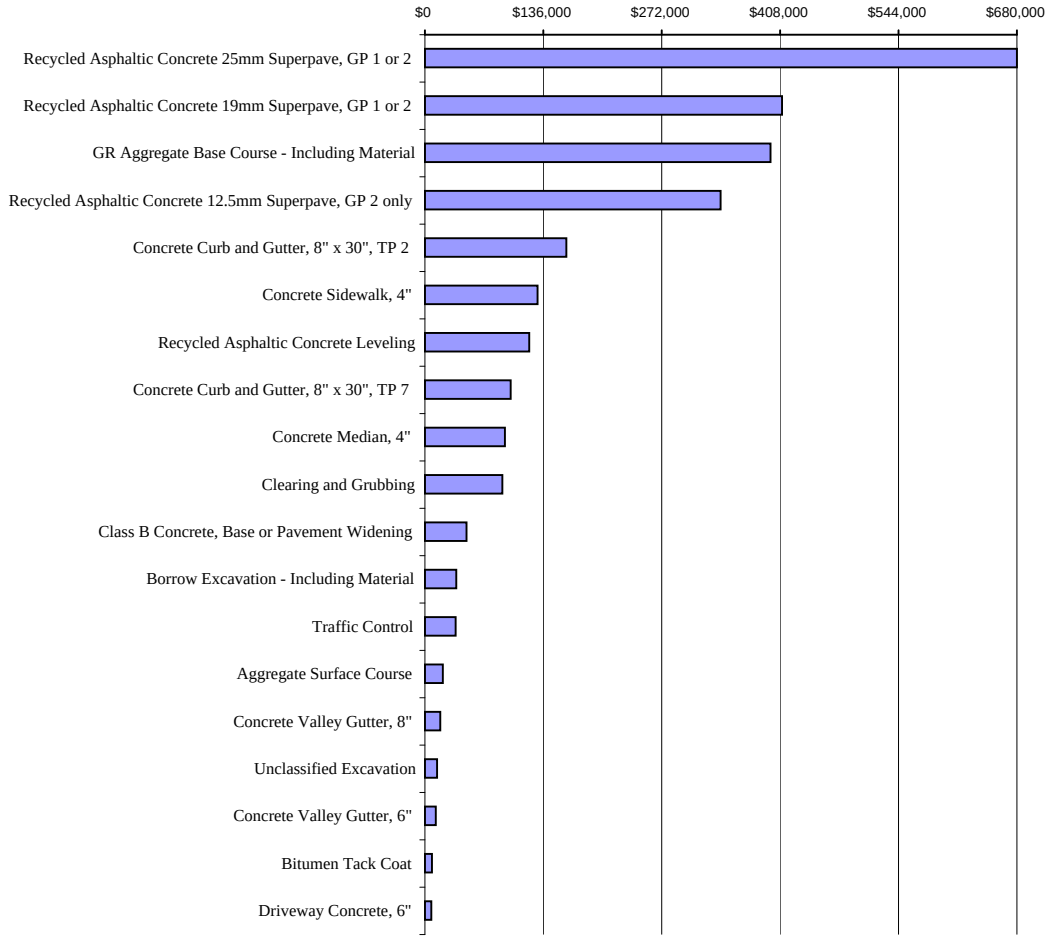
Costs in graph are not marked-up and does not include "Roadway."

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(48) - Roadway	COST	PERCENT	CUM. PERCENT
Recycled Asphaltic Concrete 25mm Superpave, GP 1 or 2	680,000	25.03%	25.03%
Recycled Asphaltic Concrete 19mm Superpave, GP 1 or 2	410,000	15.09%	40.13%
GR Aggregate Base Course - Including Material	396,720	14.61%	54.73%
Recycled Asphaltic Concrete 12.5mm Superpave, GP 2 only	340,000	12.52%	67.25%
Concrete Curb and Gutter, 8" x 30", TP 2	162,360	5.98%	73.23%
Concrete Sidewalk, 4"	129,048	4.75%	77.98%
Recycled Asphaltic Concrete Leveling	120,000	4.42%	82.40%
Concrete Curb and Gutter, 8" x 30", TP 7	98,456	3.62%	86.02%
Concrete Median, 4"	91,814	3.38%	89.40%
Clearing and Grubbing	88,608	3.26%	92.66%
Class B Concrete, Base or Pavement Widening	47,815	1.76%	94.42%
Borrow Excavation - Including Material	36,359	1.34%	95.76%
Traffic Control	35,000	1.29%	97.05%
Aggregate Surface Course	20,280	0.75%	97.80%
Concrete Valley Gutter, 8"	17,476	0.64%	98.44%
Unclassified Excavation	13,630	0.50%	98.94%
Concrete Valley Gutter, 6"	12,786	0.47%	99.41%
Bitumen Tack Coat	8,200	0.30%	99.72%
Driveway Concrete, 6"	7,718	0.28%	100.00%
Construction Subtotal	**$ 2,716,270**	**100.00%**	
Engineering and Construction a: 10.00%	$ 271,627		
Inflation Based on 8.00%* per annum for Three Years 25.97%	$ 775,957	**Construction**	
Construction Total	**$ 3,763,854**	Mark-Up:	38.57%



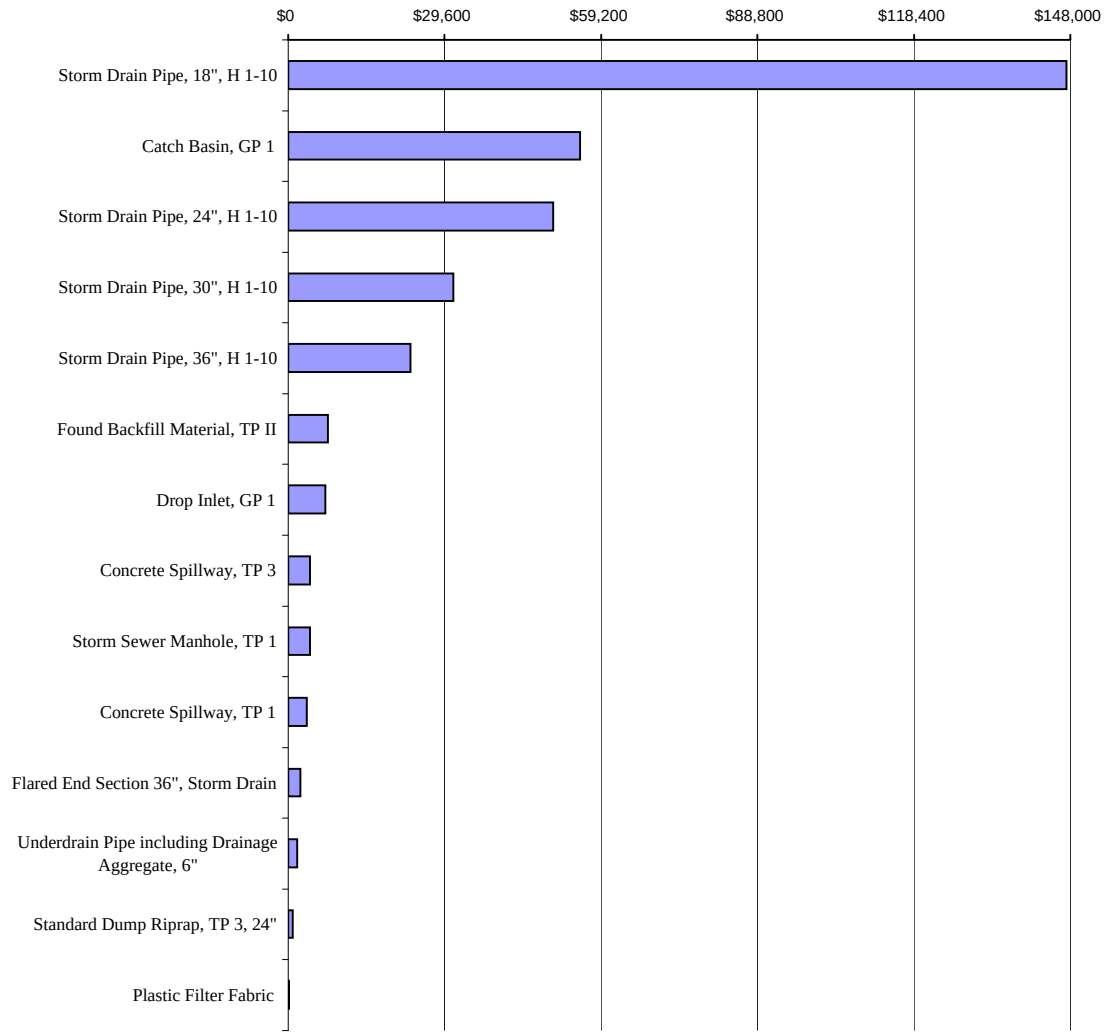
Costs in graph are not marked-up and does not include.

** Escalation rate provided by GDOT based on immediate past experience.*

COST HISTOGRAM

Project: **STP-164-1(39) & (48) STATE ROUTE 34 BYPASS WIDENING & RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Preliminary Design Stage

STP-164-1(48) - Drainage		COST	PERCENT	CUM. PERCENT
Storm Drain Pipe, 18", H 1-10		147,288	43.53%	43.53%
Catch Basin, GP 1		55,257	16.33%	59.86%
Storm Drain Pipe, 24", H 1-10		50,150	14.82%	74.68%
Storm Drain Pipe, 30", H 1-10		31,280	9.24%	83.92%
Storm Drain Pipe, 36", H 1-10		23,187	6.85%	90.77%
Found Backfill Material, TP II		7,458	2.20%	92.98%
Drop Inlet, GP 1		7,057	2.09%	95.06%
Concrete Spillway, TP 3		4,127	1.22%	96.28%
Storm Sewer Manhole, TP 1		4,124	1.22%	97.50%
Concrete Spillway, TP 1		3,487	1.03%	98.53%
Flared End Section 36", Storm Drain		2,329	0.69%	99.22%
Underdrain Pipe including Drainage Aggregate, 6"		1,646	0.49%	99.71%
Standard Dump Riprap, TP 3, 24"		896	0.26%	99.97%
Plastic Filter Fabric		95	0.03%	100.00%
Construction Subtotal		**$ 338,381**	**100.00%**	
Engineering and Construction at	10.00%	$ 33,838		
Inflation Based on 8.00%* per annum for Three Years	25.97%	$ 96,665	**Construction**	
Construction Total		**$ 468,884**	Mark-Up:	38.57%



Costs in graph are not marked-up and does not include.

** Escalation rate provided by GDOT based on immediate past experience.*

FUNCTION ANALYSIS

Function Analysis was performed to: (1) define the requirements for each project element, and (2) to ensure a complete and thorough understanding by the VE team of the basic function(s) needed to attain a given requirement. A Random Function Analysis worksheet for the project is attached.

Function Analysis is a means of evaluating a project to see if the expenditures actually perform the requirements of the project, or if there are disproportionate amounts of money spent on support functions. These elements add cost to the final product, but have a relatively low worth to the basic function.

In addition to the random Function Analysis, the VE Facilitator worked with members of the study team to develop a Function Analysis System Technique (F.A.S.T.) diagram for each phase. The F.A.S.T. diagrams were used to show the flow of function within the phases. It helps to confirm the project is addressing those issues that have been voiced by the owner as being important. The diagrams were generated by asking the key question: "What is the most important function to be accomplished by this phase?" The answer is characterized by a verb/noun pair. In turn, another question is asked: "Why?" The answer is again listed in a verb/noun pair, and the process continued from left to right. If the result is a true F.A.S.T. diagram, the flow of functions from right to left will answer the question "Why?" No F.A.S.T. diagram is ever completed. The readers of this report may wish to challenge themselves to see how far they can carry the construction of the F.A.S.T. diagram.

This F.A.S.T. diagram notes the critical function paths and identifies the projects' basic functions as **ALLEVIATING/CONGESTION** and **INCREASING/CAPACITY** by **Adding/Lanes** and **Improving Intersection Geometry**. The F.A.S.T. diagram is included at the end of this section of the report.

RANDOM FUNCTION ANALYSIS

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

SHEET NO.: 1 of 1

DESCRIPTION	FUNCTION		
	VERB	NOUN	KIND
SR 34 BYPASS WIDENING AND RECONSTRUCTION	**Increase**	**Capacity**	**B**
	Improve	Safety	RS
	Limit	Access	S
	Improve	Access	S
	Provide	Bicycle Use	S
	Provide	Pedestrian Mobility	S
	Accommodate	Railroad Expansion	RS
	Facilitate	Left Turn	RS
	Minimize	Displacement	S
	Minimize	Historic Impact	S
	Minimize	Wetlands Impact	S
	Improve	Intersection Geometry	RS
	Facilitate	Access to I-85	S
	Reduce	Travel Time	S
	Alleviate	**Congestion**	**B**
	Promote	Truck Traffic	S

Function defined as: Action Verb, Measurable Noun

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

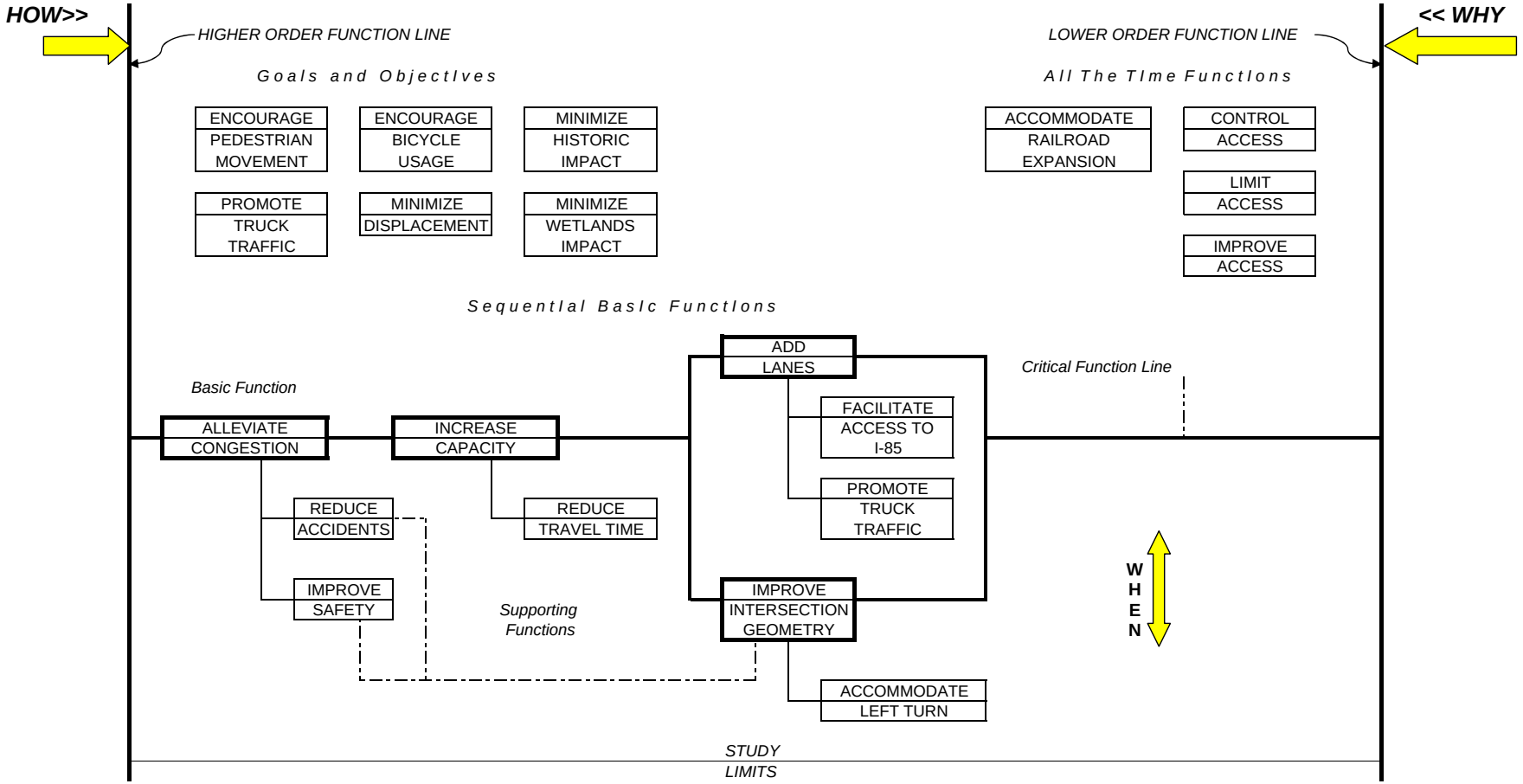
FUNCTION ANALYSIS SYSTEMS TECHNIQUE (F. A. S. T.)

SR 34 BYPASS WIDENING AND RECONSTRUCTION

STP-164-1(39), P. I. No. 322400; STP-164-1(48), P. I. No. 322405

Georgia Department of Transportation, District 3

Coweta County, Georgia



CREATIVE IDEA LISTING AND JUDGMENT OF IDEAS

During the creative phase, numerous ideas, alternative proposals and/or recommendations were generated using conventional brainstorming techniques as recorded on the following pages.

These ideas were then discussed and the advantages/disadvantages of each listed. The VE team compared each of the ideas with the concept solution determining whether it improved value, was equal in value, or lessened the value of the solution.

The ideas were then ranked on a scale of 1 to 5 on how well the VE design team believed the idea met necessary criteria and program needs. The higher rated ideas were then developed into formal alternatives and included in the VE workshop. Some ideas were judged to have minimal cost impacts on the project but provided enhancements in the form of improved operations, efficiency, constructibility or potential to save unknown or hidden costs. These were given the designation "DS" which indicates a design suggestions. This designation is also used when an idea is difficult to price but improves the functionality of the project or system, and is deemed to be of significant value to the owner, user, operator or designer.

Typically, all ideas rate 4 or above are included in the Study Report. When this is not the case, an idea was combined with another related idea or discarded, as a result of additional research that indicated the concept as not being cost-effective or technically feasible.

All readers are encouraged to review the Creative Idea Listing and Evaluation worksheets since they may suggest additional ideas that can be applied to the design.

CREATIVE IDEA LISTING

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

SHEET NO.: 1 of 2

NO.	IDEA DESCIRPTION	RATING
1	Minimize work on State Route (SR) 16	2
2	Minimize work at the beginning of the project	3+
3	Balance cut and fill	1
4	Eliminate the raised median	3
5	Use landscaped median	4
6	Use a five-lane section	4
7	Omit asphalt curb and associated drainage	4
8	Retain the current Hospital Road/SR 34 Bypass intersection alignment	5
9	Eliminate the sidewalks	3
10	Selectively minimize the sidewalks	4
11	Eliminate the bicycle lane	4
12	Use a multi-use path on one side of SR 34 Bypass	3
13	Selectively eliminate the bicycle lane	1
14	Eliminate the Jefferson Parkway Elementary School entrance on SR 34 Bypass	2
15	Improve the Jefferson Parkway Elementary School access on SR 34 Bypass	5
16	Reduce the pavement section	4
17	Use a modular block mechanically stabilized earth (MSE) wall at Wall No. 2	4
18	Do not lengthen the bridge over the CSX Railroad to accommodate the railroad's expansion	1
19	Do not replace the bridge over the CSX Railroad	1
20	Just widen the bridge over the CSX Railroad	3
21	Reduce the length of left turn lanes	4
22	Use a minimum 12-inch gutter	2
23	Cul-de sac Lullwater Circle at SR at SR 34 Bypass	4
24	Do not excavate at the bridge over the CSX Railroad	4
25	Eliminate the southern driveway into Milano's Restaurant	4
26	Eliminate the curb cut at Milano's Restaurant	4
27	Do not improve the drive into the Wahoo Creek Water Pollution Control Plant	4

Rating: 1 → 2 = Not to be Developed; 3 – 4 = Varying Degree of Development Potential; 5 = Most Likely to be Developed;
ABD = Already Being Done; N/A = Not Applicable

CREATIVE IDEA LISTING

PROJECT: **STP-164-1(39) and (48) STATE ROUTE 34 BYPASS WIDENING AND RECONSTRUCTION**
Coweta County, Georgia Department of Transportation, District 3
Final Design Stage

NO.	IDEA DESCIRPTION	RATING
28	Keep the current alignment at Coweta Fayette Electrical	4
29	Improve Cross Brook Drive and Harpers Farm Drive intersections with SR 34 Bypass	DS
30	Keep the Ronny D. Jones Enterprises driveway in its current location and improve as appropriate	4
31	Eliminate need for temporary sediment basins	3
32	On US 29 use the “chevron” striped area as the turning lane	4
33	Minimize the number of accesses/curb cuts into the Phillips 66 gas station at the corner of SR 34 Bypass and SR 70/Roscoe Road	DS
34	Grade separate the SR 34 Bypass and SR 34 intersection	1
35	Grade separate the RS 34 Bypass/SR 34 intersection with a SPUI [Single Point Urban Intersection]	1
36	Use 11-foot lanes throughout	5
37	Do not use full depth shoulders throughout	4
38	Remove taper from the bridge over the CSX Railroad	DS
39	Eliminate the “U” turn lane at Hospital Road	4

Rating: 1 → 2 = Not to be Developed; 3 – 4 = Varying Degree of Development Potential; 5 = Most Likely to be Developed;
ABD = Already Being Done; N/A = Not Applicable