

VALUE ENGINEERING STUDY

**Project # STP00-0065-02(013) PI No. 621490-
SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd
Pickens County, Georgia**

Prepared for:



**One Georgia Center
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May 12, 2016



May 12, 2016

GDOT - Engineering Services
One Georgia Center - 5th Floor
600 W. Peachtree Street NW
Atlanta, GA 30308

Attention: Matt Sanders, AVS
Value Engineering Specialist

Reference: VE Workshop – SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd.,
Pickens County, GA
Project #: STP00-0065-02(013) - PI#: 621490-

Dear Mr. Sanders:

McDonough Bolyard Peck, Inc. is pleased to submit two (2) hard copies and one (1) CD of the Value Engineering Study Report on the above referenced project. We appreciate the assistance and participation of the GDOT management personnel as well as the design team.

This Workshop resulted in the development of twelve (12) value-enhancing proposals. We hope that incorporation of some of these value improvement alternatives provided herein results in an enhanced project in relation to cost, constructibility and long-term performance of the project features.

Please feel free to contact me at 404-414-9951 or torr@mbpce.com to discuss any information within this report. We look forward to the next opportunity to be of service to the Georgia Department of Transportation.

Sincerely,

A handwritten signature in blue ink that reads "Tom Orr".

Tom Orr, PE, CVS
VE Team Leader

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PROJECT DESCRIPTION AND BACKGROUND

This SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd. project involves widening and reconstruction of SR 53 Bu in Pickens County in Georgia. The project will widen and reconstruct the existing two-lane with a 4-lane divided highway along a portion of the route and one-way pairs along the remaining portion of the route.

The proposed project involves work along a 3.6-mile section of SR 53 Bu beginning west of SR 515 to an intersection at CR 243/Industrial Blvd. in Jasper. The new 4-lane divided roadway portion consists of two lanes in each direction with 20' raised median, and 12' outside shoulders with 5' wide sidewalks on each side. The one-way pair sections consist of two 12' wide lanes with curb and gutter and 12' shoulders with 5' wide sidewalks. The right-of-way varies throughout the corridor. The design speeds are 45 MPH along the 4-lane divided highway and 30 MPH along the one-way pairs.

Project components include:

- New 4-lane (12' travel lanes) divided roadway with 20' wide raised median
- Outside shoulders of 12' width and 5' wide sidewalks
- One-way pairs with two 12' wide lanes, curb and gutter and 12' shoulders with 5' wide sidewalks
- Nine signals
- Extension of culverts at streams

KEY INFORMATION/NOTES

Introduction

MBP conducted the Value Engineering Team Study on SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd. in Pickens County. The VE study was conducted for three and ½ days, 9 - 12 May, 2016, at the Georgia Department of Transportation 5th floor Conference Room in Atlanta, GA. The study team was furnished with a concept report and preliminary construction plans for use in conducting the VE workshop.

The following individuals were members of the VE team:

Name	Firm	Discipline
Tom Orr, PE, CVS	MBP	VE Team Leader (VETL)
Gary Newton, PE	Kimley-Horn	Roadway Engineer
Dominic Saulino, PE	RS&H	Roadway Engineer
Scott Jordan, PE	Southeastern Engineering	Construction

Value Engineering Job Plan

The Value Engineering Study followed the Value Engineering Job Plan as certified by SAVE International as follows:

- Information Phase (Monday)
- Function Analysis Phase (Monday)
- Creative Phase (Monday)
- Evaluation Phase (Monday)
- Development Phase (Tuesday - Wednesday)
- Presentation Phase (Thursday am)

Information Phase

The VE team was first briefed on the project design by Georgia DOT project management and CH2M Hill design team representatives in a Design Presentation the morning of the first day of the VE Study. The briefing included a review of the design requirements and rationale for the selection and arrangement of the major project features. Discussions regarding alternatives considered, adjacent properties/facilities, and project criteria and constraints were included in the design presentation.

Project Design Criteria

During the meeting, project design criteria were identified. The following listing identifies the design criteria with which the project must comply:

- AASHTO Design Policies
- Environmental Restrictions
- Historical Restrictions

Project Constraints

During the presentation by the design team on the project overview, the VE Team was alerted to the stakeholder's constraints on this project which include:

- Project must meet Purpose and Need of reducing congestion on SR 53 Bu
- Avoid or minimize impacts to cemeteries and historical properties along corridor

Function Analysis

As a basic part of the VE process, the team conducted a Function Analysis session on the project to identify the needs and goals of the project and facilitate the creative idea session, by addressing functions as opposed to the specific design elements.

The Basic Function of the project is to *"Reduce Congestion"*. A detailed project function analysis of the characteristics of the project and the project features is presented in the Appendix.

Risk Analysis

The group identified the following project risk elements, which may impact the SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd. project. This exercise served as a catalyst for the Creative Phase of the study when several ideas were suggested which would mitigate these project risks.

Identified project risks include:

Risk Elements/Concerns

- Difficulty in Staging/Constructibility
- Stream Impacts
- Cemeteries and Historical Impacts
- School Property Impacts
- Future Use of School Property Undefined

- Wetlands Impacts
- Property Owner Impacts
- Public Concerns/Project Stakeholder Support
- Residential and Commercial Acquisition
- Quality of Existing Pavement Unknown
- Impact to Travelling Public
- Impacts on Businesses
- Impacts to Utilities

Creative Phase

The Creative Phase of the VE study was initiated the afternoon of the first day of the study. A total of twenty six (26) creative ideas were generated for further investigation by the team. The creative ideas focused on areas of the project which the VE Team felt had the most opportunity for value improvement, including:

- Most appropriate location of one-way pair split
- Shifting vertical realignment of roadway closer to existing
- Reducing right-of-way acquisition required
- Eliminating signals and turn lanes based on new traffic counts
- Reducing width of new corridor and reducing impacts

A listing of all creative ideas on this project is included in the Appendix.

Alternative Idea Evaluation Criteria

The session participants identified the characteristics for evaluating the VE ideas for which alternatives would be the most acceptable for incorporation in the project. The highest ranked ideas would satisfy several of these criteria. The evaluation criteria for VE ideas are as follows:

VE Idea Evaluation Criteria

- Improves Operations
- Reduces Construction Time
- Acceptability – GDOT/Stakeholder
- Reduces Impacts – Property/Business/Environmental
- Reduces Costs
- Enhances Constructibility
- Reduces Maintenance

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE session participants during an Analysis/Judgment Phase session. The intent of the meeting was to allow the participants an opportunity to discuss and evaluate the ideas. A few of the VE ideas were dropped at that time as being conceptually unacceptable. The ranking session consisted of the VE Team members assigning a ranking for each idea. The ranking was based on how each idea improves the value of the project when considered against the evaluation criteria listed previously. All ideas were given a designation of 1 to 5, with a 5 being those ideas that brought the most added value to the project. This is a time management tool to identify those proposals that have the greatest potential. Approximately twelve (12) out of the original twenty six (26) creative ideas were deemed promising for further investigation and analysis by the VE Team.

The time management ranking system used by the VE Team is as follows:

Value Improvement Ranking of Idea

- 5 Points – Excellent Idea
- 4 Points – Very Good Idea
- 3 Points – Good Idea
- 2 Points – Fair Idea
- 1 Points – Do Not Develop

Development Phase

The specific proposals found in the body of this report represent the positive results of investigations by the VE team on the SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd. project. Each proposal represents a quality enhancing and/or cost saving alternative, which is documented by words, drawings, estimates and calculations. The proposal format presents the idea, describes the original design element proposed for change and the proposed change, lists the perceived advantages and disadvantages of the proposed change and supports the idea with a detailed cost estimate for the original and proposed design. Where necessary for clarity, the proposal also includes thumbnail design drawings and supporting engineering calculations.

Presentation Phase

A presentation to the GDOT and design team representatives was conducted on May 12, 2016 at 9:00 am.

Basis of VE Cost Savings

The cost information for proposals in this report are based on the cost data prepared by the design team, GDOT Item Mean Summary (with cost data for prior 4 years), VE Team member experience, and discussions with vendors/Contractors. Overhead and profit are included in the project cost estimate and the GDOT Item Mean. Therefore, no additional markups are applied. The savings presented in the proposals is a general order of magnitude (estimate of the potential savings) if the idea were to be accepted. These figures are solely intended to identify the most attractive design solution, and are not prepared to represent a net deduction to the overall project budget. The costs are in 2016 dollars.

Evaluation of Alternatives

When reviewing the value engineering proposals, consider each part of an alternative on its own merit. There may be a tendency to disregard an entire alternative because of a concern about one aspect of it. We encourage partial acceptance of ideas; thus, each aspect of an alternative should be considered for incorporation into the design, even if the entire alternative is not implemented. Variations of these proposed alternatives are encouraged.

VALUE ENGINEERING RESULTS

The VE Team generated 26 creative ideas and developed 12 proposals for consideration by GDOT. Brief outlines of the VE proposals are as follows:

Proposal Highlights

R-1.0 – Relocate One-way Pair Split Eastward to Begin at Mary Street Intersection. In the current design, SR 53 splits at Bryant Street and the Eastbound portion is on new location across open field and curves behind school property. In R-1.0, it is proposed to relocate the split Eastward to begin at Mary Street, eliminate the new location for the Eastbound pair (on the South side of the school) and utilize the existing street network. This change includes one signalized intersection at Mary Street and also at the relocated middle school driveway. Design is based on a 30 MPH alignment with 4% e_{max} . This eliminates the new location alignment for the Eastbound pair, which impacts rural properties and the school, and still meets the purpose and need for the project. This alternative results in reduced right of way acquisitions, improves vehicle movements around the school (eliminates requirement to initially go westbound from front of school for persons needing to go East) and provides a project cost savings of \$1,337,911.

R-3.0 – Shift Vertical Alignment Closer to Existing on Westbound Pair from Sta 107+00 to 114+00. In the current design, vertical alignments are restricted to a maximum 6.0% grade resulting in a 3 to 4 feet elevation difference between proposed and existing grades. In R-3.0, it is proposed to utilize the GDOT Policy Manual allowance to exceed this value by 1.0% for short sections less than 500 feet and for one-way downgrades. The change from 6% to 6.42% grade allows the road to more closely match existing grades. This alternative minimizes property impacts, reduces wall heights and construction fill heights, simplifies constructibility (staging) and provides a project cost savings of \$123,423.

R-4.0 – Shift Vertical Alignment Closer to Existing on 4-Lane Section from Sta 27+00 to 53+00. In the current design, vertical alignments are restricted to a maximum 6.0% grade resulting in a 7 to 8 feet elevation difference between proposed and existing grades. In R-4.0, it is proposed to utilize the GDOT Policy Manual allowance to exceed this value by 1.0% for short sections less than 500 feet and for one-way downgrades. Along this section, curves are increased from 6.0% to 6.67% grade and from 5.97% to 7.0% grade. This alternative minimizes property impacts, reduces wall and construction fill heights, simplifies constructibility (staging) and provides a project cost savings of \$276,975.

R-8.0 – Reduce Lane Widths from 12' to 11'. In the current design, all lane widths on new pavement sections are shown as having 12' widths. In R-8.0, it is proposed to construct the new pavement with lane widths of 11' in lieu of 12'. The 11' lane width is acceptable for roadways which are less than 50 MPH with low truck volumes (only 5% on this project). This alternative will provide a project cost savings of \$656,901.

R-10.0 – Reduce Raised Median Width from 20’ to 16’. The current design of the four-lane typical sections includes a 20-ft raised paved median. In R-10.0, it is proposed to reduce the raised median width to 16 ft. in lieu of 20 ft. This reduction requires a design variance but these have been commonly granted by GDOT in the recent past, especially on projects such as this with no drainage structures in the median. The median width reduction will reduce right-of-way impacts, reduce impervious area and result in a project cost savings of \$281,104.

R-11.0 – Use Existing 48” Storm Drain Pipe (SDP) in Lieu of Replacing with a Proposed 48” SDP from Structure I-12 to I-8. In the current design, an existing 48” SDP is being replaced with a proposed 48” SDP at Sta 110+55 (Lt) to Sta 113 +45. Also, in the same area a new 18”SDP is being placed from Structure I-10 to I-11. In R-11.0, it is proposed to use the existing 48” SDP and eliminate the new 48” pipe from I-12 to I-8. Route a new 18” SDP from I-10 to I-12 in lieu of I-11, and eliminate the proposed new junction box I-11. This proposal will reduce time and construction staging, and result in a project cost savings of \$35,540.

R-12.0 – Eliminate Wall #8 and Slope to Existing Grade. The current design includes a Type P3 Retaining Wall (Wall #8) from Sta 109+50 to Sta 114+15. This is located adjacent to the existing football/soccer field at the Middle School; however the edge of those fields are approximately 100 feet from the proposed wall. In R-12.0, it is proposed to eliminate Wall #8, install guardrail and slope to existing grade. This alternative eliminates the unnecessary wall and associated maintenance, and provides a project cost savings of \$200,089.

R-16.0 – Utilize Concrete Header Curb in lieu of Gravity Wall #12 and Slope to Proposed Sidewalk. In the current design, a proposed gravity wall (Wall #12) is shown from Sta 236+15 to Sta 237+65 on the Eastbound one-way pair. In R-16.0, it is proposed to use concrete header curb in lieu of Wall #12 and then slope to proposed sidewalk. This alternative eliminates the unnecessary features and associated maintenance, and provides a project cost savings of \$14,122.

R-19.0 – Reduce Improvements to Holly Street. In the current design, proposed improvements to Holly Street begin at Sta 232+50 and end at Sta 245+00 for a distance of 1,250 LF. In R-19.0, it is proposed to begin work on Holly Street at Sta 233+75 and end work at Sta 242+00. The proposed change will reduce 425 LF of milling and overlay along the existing road. This alternative eliminates unnecessary work and provides a project cost savings of \$8,749.

R-20.0 – Limit Improvements West of SR 515 to Only Right Turn Taper from SR 53 to SR 515 South. In the current design, the intersection of SR 53 and SR 515 is designed for dual left turning lanes in both the east and west bound approaches. This configuration was based on traffic surveys performed in the 2006-2008 timeframe. However, updated traffic counts were obtained earlier this year that showed reduced traffic volumes for movements at this intersection. In R-20.0, it is proposed to reduce the dual left turning lanes in both directions to one left turning lane and limit construction on the west side of SR 515 to only extending the right turning lane from SR 53 onto SR 515 southbound. As a result of the updated traffic numbers, dual left turning lanes that were part of the initial design are no longer warranted. This proposed change will make the intersection more efficient in the off peak hours without the dual left turns, and result in a project cost savings of \$288,306.

R-21.0 – Eliminate Sidewalks on Eastbound Pair from Split to Holly Street. In the current design, there are sidewalks on both sides of the road in the new location section of SR 53 eastbound. In R-21.0, it is proposed to remove sidewalk from the two-way split to Holly Street on the north and south side of SR 53 eastbound. This new section of roadway will likely not have much pedestrian activity. This proposed change will eliminate unnecessary features and result in a project cost savings of \$50,685.

R-22.0 – Eliminate Signals at Holly Street and Bryant Street. In the current design, the intersection at Bryant Street and SR 53 has a proposed signal. Also the intersections at Holly Street and both of the new one-way pairs have a proposed signal. Signals at these locations were based on traffic surveys performed in the 2006-2008 timeframe. However, updated traffic counts were obtained earlier this year that showed reduced traffic volumes for movements at these intersections. In R-22.0, it is proposed to remove the signals at Bryant Street at SR 53, Holly Street at SR 53 westbound and Holly Street at SR 53 eastbound. As a result of these updated traffic numbers, which are lower than the traffic counts at the original design, signals are no longer warranted at these locations. In addition, the intersections will be more efficient in the off-peak hours without the new traffic signals. This alternative eliminates unnecessary features, eliminates ongoing maintenance on these features, improves operations, and provides a project cost savings of \$240,000.

VALUE ENGINEERING TEAM STUDY

SUMMARY OF VALUE ENGINEERING PROPOSALS

Project # STP00-0065-02(013) PI No. 621490-
SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd
Pickens County, Georgia

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
ROADWAY (R)			
1.0	Relocate One-way Pair Split Eastward to Begin at Mary Street Intersection	\$1,337,911	Mutually exclusive with 19.0 & 21.0; cost savings overlap w/ 22.0
3.0	Shift Vertical Alignment Closer to Existing on Westbound Pair from Sta 107+00 to 114+00	\$123,423	Mutually exclusive with 1.0; Cost savings overlap w/ 12.0
4.0	Shift Vertical Alignment Closer to Existing on 4-Lane Section from Sta 27+00 to 53+00	\$276,975	
8.0	Reduce Lane Widths from 12' to 11'	\$656,901	
10.0	Reduce Raised Median Width from 20' to 16'	\$281,104	
11.0	Use Existing 48" Storm Drain Pipe (SDP) in Lieu of Replacing with a Proposed 48" SDP from Structure I-12 to I-8	\$35,540	
12.0	Eliminate Wall #8 and Slope to Existing Grade	\$200,089	Cost savings overlap with 3.0
16.0	Utilize Concrete Header Curb in lieu of Gravity Wall #12 and Slope to Proposed Sidewalk	\$14,122	
19.0	Reduce Improvements to Holly Street	\$8,749	Mutually exclusive with 1.0
20.0	Limit Improvements West of SR 515 to Only Right Turn Taper from SR 53 to SR 515 South	\$288,306	
21.0	Eliminate Sidewalks on Eastbound Pair from Split to Holly Street	\$50,685	Mutually exclusive with 1.0
22.0	Eliminate Signals at Holly Street and Bryant Street	\$240,000	Cost savings overlap with 1.0

ROADWAY (R)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-1.0	PAGE NUMBER:	1 of 5
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION:	Relocate One-way Pair Split Eastward to Begin at Mary Street Intersection
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ORIGINAL DESIGN: In the current design, SR 53 splits at Bryant Street and the Eastbound portion is on new location across open field and curves behind school property. The Eastbound pair includes two signalized intersections.

PROPOSED CHANGE: The proposed change relocates the split Eastward to begin at Mary Street, eliminates the new location for the Eastbound pair (on the South side of the school) and utilizes the existing street network. The change includes one signalized intersection at Mary Street and also at the relocated middle school driveway. Design is based on a 30 MPH alignment with 4% e_{max} .

JUSTIFICATION: The new location alignment for the Eastbound pair, which impacts rural properties and the school, can be eliminated and still meet the purpose and need for the project.

ADVANTAGES:

- Reduces Cost
- Reduces ROW Impacts
- Reduces impacts to the buffered stream
- Eliminates need for one signal

DISADVANTAGES:

- U-turn required for WB-Pair to EB-Pair
- Impacts to school parking lot

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,824,040	\$	\$ 2,824,040
PROPOSED CHANGE:	\$ 1,486,129	\$	\$ 1,486,129
SAVINGS:	\$ 1,337,911	\$	\$ 1,337,911

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-1.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement	1	SY	11,400	\$45.06	\$513,684
ROW	1	AC	3.98	\$450,000	\$1,791,000
Wall Type P2	1	LF	700	\$363.66	\$254,562
Wall Type P3	1	LF	200	\$523.97	\$104,794
Signals	1	LS	2	\$80,000	\$160,000
SUBTOTAL – COST TO PRIME					\$2,824,040
MARKUP					--
TOTAL CONTRACT COST					\$2,824,040

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement	1	SY	8,160	\$44.93	\$366,629
ROW	1	AC	2.31	\$450,000	\$1,039,500
Wall Type P2	1	LF	0	\$363.66	\$0
Wall Type P3	1	LF	0	\$523.97	\$0
Signals	1	LS	1	\$80,000	\$80,000
SUBTOTAL – COST TO PRIME					\$1,486,129
MARKUP					--
TOTAL CONTRACT COST					\$1,486,129

Difference [Original-Proposed] **\$1,337,911**

SOURCES

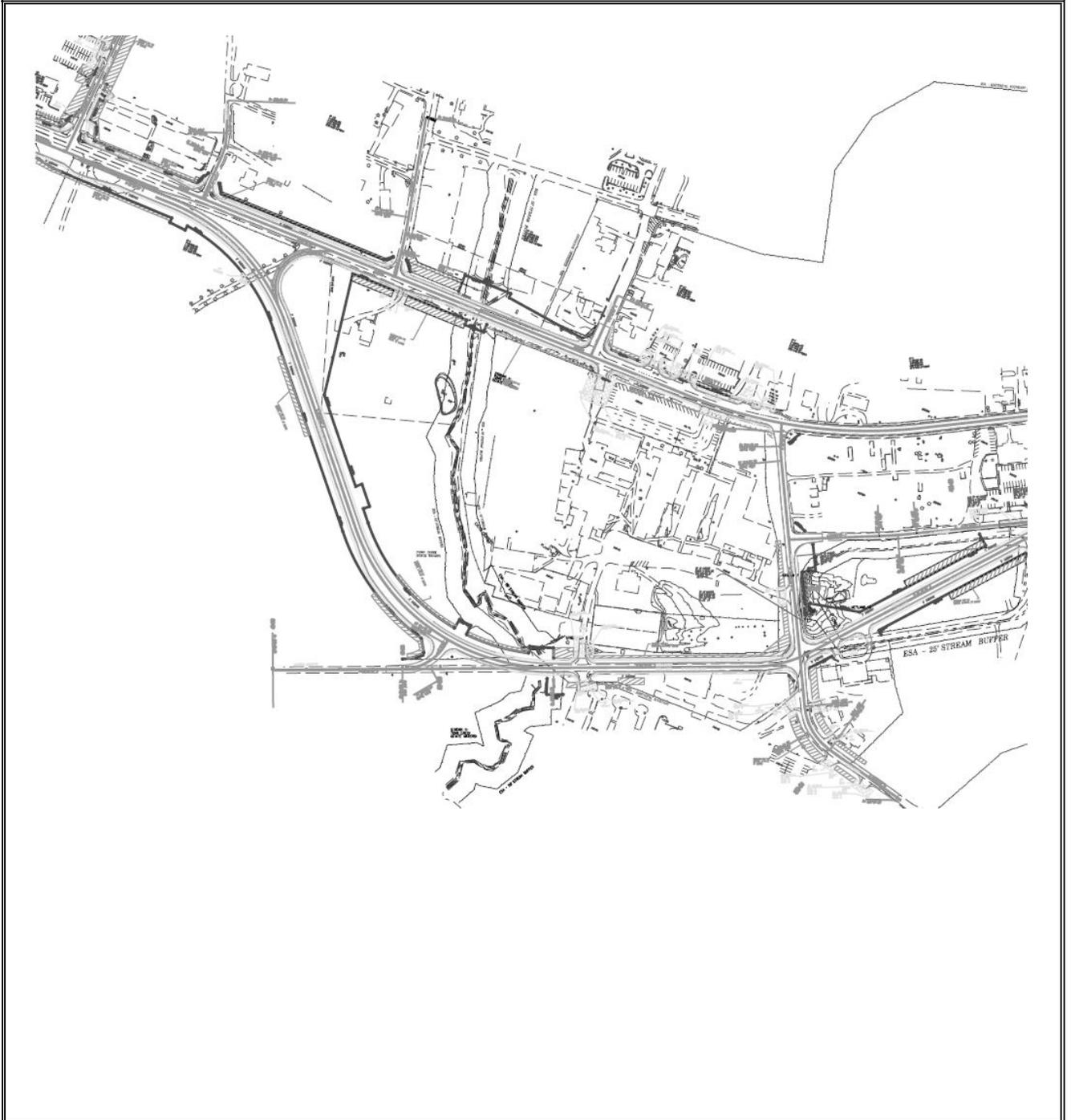
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|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. MBP Estimate Database | 6. Vendor (Specify) |
| 3. GDOT Item Mean Summary | 7. Other (Specify) |
| 4. Means Estimating Manual | |

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-1.0

PAGE NUMBER: 3 of 5

PROJECT #/PI #: STP00-0065-02(013) / 621490-

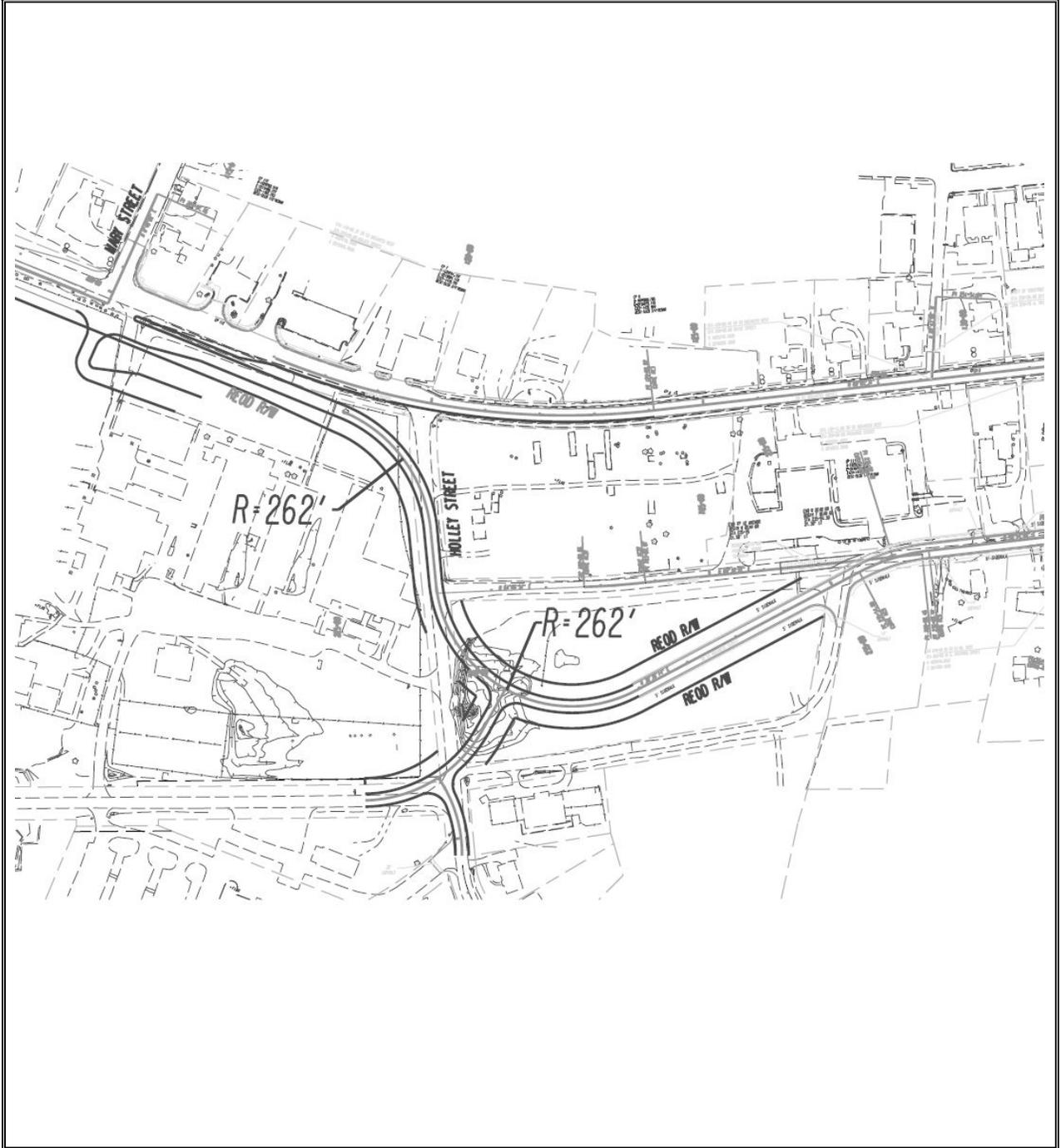


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-1.0

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PROJECT #/PI #: STP00-0065-02(013) / 621490-



CALCULATIONS

PROPOSAL NUMBER: R-1.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Current Design Pavement Cost Calculations:

310-1101: 9" GAB = 0.51 tons/SY x \$14.31/ton = \$7.30/SY
 402-3121: 990#/sy Asph 25MM = (990#/2000#)(\$52.11/T) = \$25.79/SY
 402-3190: 220#/sy Asph 19MM = (220#/2000#)(\$57.19/T) = \$6.29/SY
 402-3130: 165#/sy Asph 12.5MM = (165#/2000#)(\$65.64/T) = \$5.42/SY
 413-1000: 4 layers tack coat = 0.035 gals/SY/layer x 4 x \$1.89/gal = \$0.26
 Total pavement cost = **\$45.06/SY**

Current Design Pavement Quantities

EB Pair Sta 200+00 to Sta 228+00 = 2800LF x 24FT/9SF/SY = 7,467 SY
 Sta 213+50 to Sta 216+00 = 250LF x 12FT/9SF/SY = 333 SY
 Loop = 200 LF x 12FT/9SFT/SY = 267 SY
 Holly Street Sta 232+50 to Sta 245+00 = 1250LF x 24FT/9SF/SY = 3,333 SY

 TOTAL = 11,400 SY

Proposed Design Pavement Quantities:

SR 53 BUS Sta 100+00 to Sta 113+85 = 1385LF x 24FT/9SF/SY = 3,693 SY
 EB Pair/Holly Street = 1285LF x 24FT/9SF/SY = 3,427 SY
 Industrial Boulevard Tie = 390LF x 24FT/9SF/SY = 1,040 SY

 TOTAL = 8,160 SY

Commercial R/W Cost Calculations:

\$300,000/ac + 50% counter/condem. = \$450,000/ac for partial property (Prelim. R/W Est)
 \$225,000/ac for permanent easement at 50% of ROW

Residential R/W Cost Calculations:

No residential R/W acquisition identified (1 displacement at \$40,000)

 Current Total = 173,200SF/43560SF/AC = 3.98 AC x \$450,000/AC = \$1,791,000

 Proposed Total = 100,813SF/43560SF/AC = 2.31AC x \$450,000/AC = \$1,039,500

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-3.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Shift Vertical Alignment Closer to Existing on Westbound Pair from Sta 107+00 to 114+00

ORIGINAL DESIGN: In the current design, the vertical curve at PI Station 112+13.86 is 750 ft. in length with an approach grade of 6% and an exiting grade of 4.4344%. The maximum grade used for design on the mainline is 6% based on Rolling Rural Arterials at 45 MPH. The K value is 71.84. This creates up to 4 feet of fill in some areas. The proposed vertical grade adjustment requires a GDOT P wall to the south and W-Beam guardrail to the north. The existing 8’x8’ double box culvert is being extended approximately 32 ft. to the north.

PROPOSED CHANGE: It is proposed to change the approach grade from 6% to 6.42% to match the existing grade and create two small vertical curves to more closely match the existing. The first curve will be approximately 310 ft. in length with the PVI at station 110+95 and the second curve will be approximately 100 ft. in length with the PVI at station 114+80. Both curves meet the design speed of 30 MPH required for the one-way pairs. This vertical change will minimize the length of the culvert extension and reduce P3 walls to P2 walls and some P2 walls to P1 walls.

JUSTIFICATION: Per the GDOT Design Policy Manual Section 4.3.2, maximum grades can increase by 1% for short sections less than 500 ft. and one way downgrades - this section of the roadway meets both of these criteria. Adjusting the approach grades allows the proposed grade to more closely follow the existing grade and therefore minimize property impacts, reducing wall heights and construction fill heights, and enhancing constructibility (staging).

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> • Reduces Costs • Improves Constructibility (Staging) • Reduces Impacts 	<ul style="list-style-type: none"> • Steeper Grade • Less Cover over culvert

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 299,889	\$	\$ 299,889
PROPOSED CHANGE:	\$ 176,466	\$	\$ 176,466
SAVINGS:	\$ 123,423	\$	\$ 123,423

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-3.0	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Class A Concrete (500-3101)	1	CY	69	\$536.48	\$37,018
Class A Concrete, Type P1, Retaining Wall (500-3110)	1	LF	100	\$306.45	\$30,645
Class A Concrete, Type P2, Retaining Wall (500-3115)	1	LF	100	\$363.66	\$36,366
Class A Concrete, Type P3, Retaining Wall (500-3120)	1	LF	215	\$523.97	\$112,654
Bar Reinf Steel (500-3200)	1	LB	7,056	\$0.63	\$4,456
Permanent Easement	1	AC	0.35	\$225,000	\$78,750
SUBTOTAL – COST TO PRIME					\$299,889
MARKUP					--
TOTAL CONTRACT COST					\$299,889

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Class A Concrete (500-3101)	1	CY	22	\$536.48	\$11,803
Class A Concrete, Type P1, Retaining Wall (500-3110)	1	LF	315	\$306.45	\$96,532
Class A Concrete, Type P2, Retaining Wall (500-3115)	1	LF	100	\$363.66	\$36,366
Bar Reinf Steel (500-3200)	1	LB	2,205	\$0.63	\$1,390
Permanent Easement	1	AC	0.135	\$225,000	\$30,375
SUBTOTAL – COST TO PRIME					\$176,466
MARKUP					--
TOTAL CONTRACT COST					\$176,466

Difference [Original-Proposed] **\$123,423**

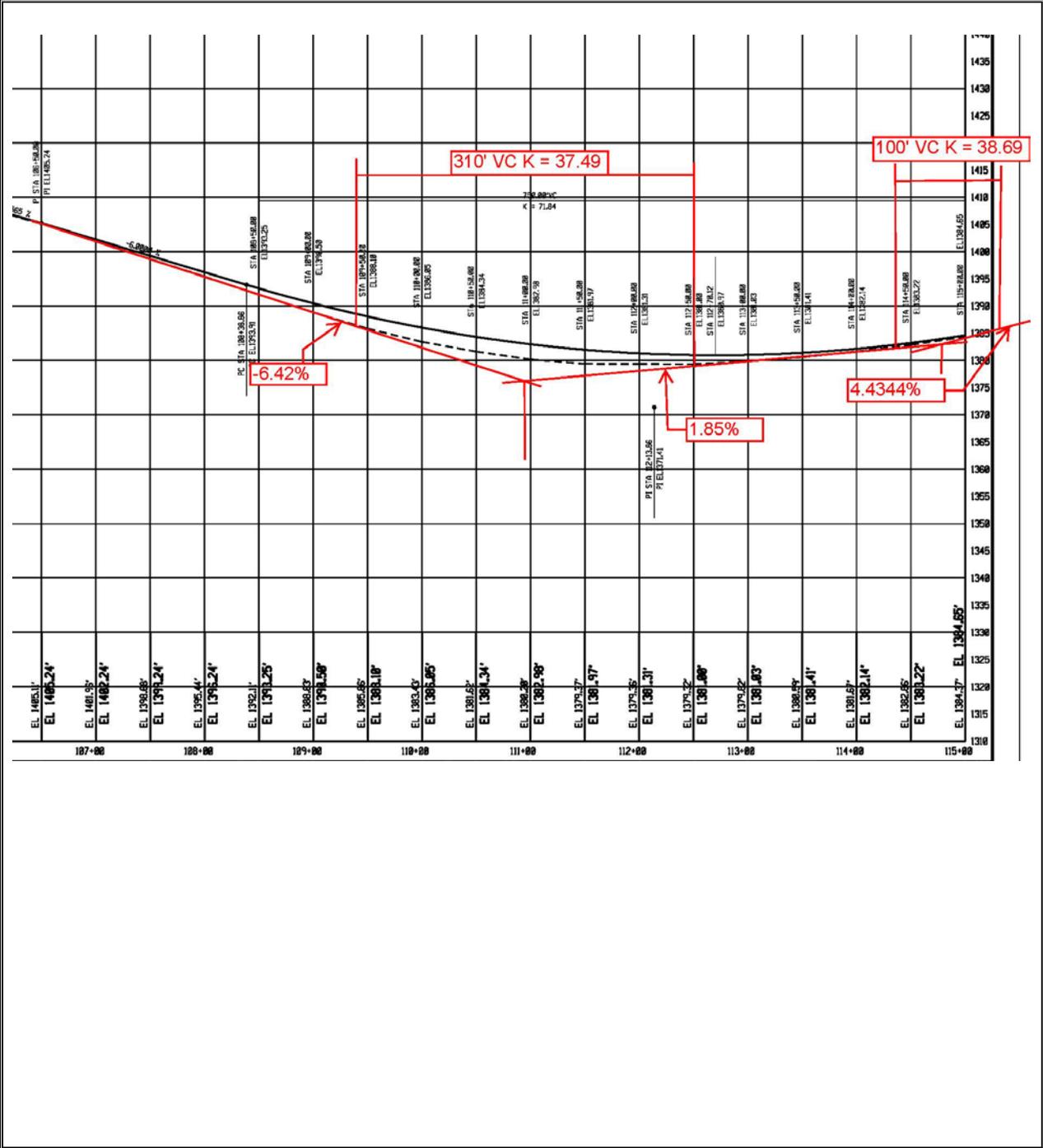
SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-3.0 PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-



CALCULATIONS

PROPOSAL NUMBER: R-3.0	PAGE NUMBER: 4 of 4
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PROJECT #/PI #: STP00-0065-02(013) / 621490-

Commercial R/W Cost Calculations:

\$300,000/ac + 50% counter/condem. = \$450,000/ac for partial property (Prelim. R/W Est)

\$225,000/ac for permanent easement at 50% of ROW

Residential R/W Cost Calculations:

No residential R/W acquisition identified (1 displacement at \$40,000)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-4.0	PAGE NUMBER: 1 of 6
-------------------------------	----------------------------

PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Shift Vertical Alignment Closer to Existing on Four-lane Section from Station 27+00 to 53+00

ORIGINAL DESIGN: In the current design, the first vertical curve at PI Sta 31+25 is 400 ft. in length with an approach grade of -6% and an exiting grade of -1.0838%. The second vertical curve at PI Sta 36+50 is 440 ft. in length with an approach grade of -1.0838% and an exiting grade of -5.9713%. The third vertical curve at PI Sta 47+17.63 is 950 ft. in length with an approach grade of -5.9713% and an exiting grade of 5.7885%. The maximum grade used for design on the mainline is 6% based on Rolling Rural Arterials at 45 MPH. This creates up to 8 ft. of fill in some areas. Sammy McGee Blvd. at SR 53 has approximately 7 ft. of grade change.

PROPOSED CHANGE: It is proposed to change the approach grade of the first curve from 6% to 6.67% to more closely match the existing grade coming from SR 515. The PI at Sta 31+25 will remain at about the same location but will be lowered in elevation by approximately 4 ft. to 1417. The PI at Sta 36+50 will move to approximately Sta 36+10 at the same elevation as the existing PI of the curve. The exiting of the 2nd curve and the approach of the 3rd curve are raised from 5.97% to 7.0 % grade. The PI at Sta 47+17.63 will move to about Sta 46+15 with an elevation of approximately 1355. A new 110 ft. vertical curve is added at Sta 51+25.

JUSTIFICATION: Per the GDOT Design Policy Manual Section 4.3.2, maximum grades can increase by 1% for short sections less than 500 ft. and one way downgrades - this section of the roadway where grade changes proposed over 6% are to be utilized are less than 500 ft. in length. Increasing the maximum grades to 7% allows the proposed grades to more closely follow the existing grade, minimizing property impacts, and reducing wall and fill heights.

ADVANTAGES:

- Reduces Costs
- Improves Constructibility (Staging)
- Reduces Impacts

DISADVANTAGES:

- Steeper Grades

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 548,841	\$	\$ 548,841
PROPOSED CHANGE:	\$ 271,866	\$	\$ 271,866
SAVINGS:	\$ 276,975	\$	\$ 276,975

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-4.0	PAGE NUMBER: 2 of 6
-------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Class A Concrete, Type P1, Retaining Wall (500-3110)	1	LF	250	\$306.45	\$76,613
Class A Concrete, Type P2, Retaining Wall (500-3115)	1	LF	365	\$363.66	\$132,736
Class A Concrete, Type P3, Retaining Wall (500-3120)	1	LF	440	\$523.97	\$230,547
Asphalt at ties for Sammy McGhee and Mountainside Drive	1	SY	1467	\$28.49	\$41,795
Permanent Easement (reduction)	1	AC	0.14	\$225,000	\$30,992
Right of Way (reduction)	1	AC	0.08	\$450,000	\$36,158
SUBTOTAL – COST TO PRIME					\$548,841
MARKUP					--
TOTAL CONTRACT COST					\$548,841

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Class A Concrete, Type P1, Retaining Wall (500-3110)	1	LF	365	\$306.45	\$111,855
Class A Concrete, Type P2, Retaining Wall (500-3115)	1	LF	440	\$363.66	\$160,011
SUBTOTAL – COST TO PRIME					\$271,866
MARKUP					--
TOTAL CONTRACT COST					\$271,866

Difference [Original-Proposed] **\$276,975**

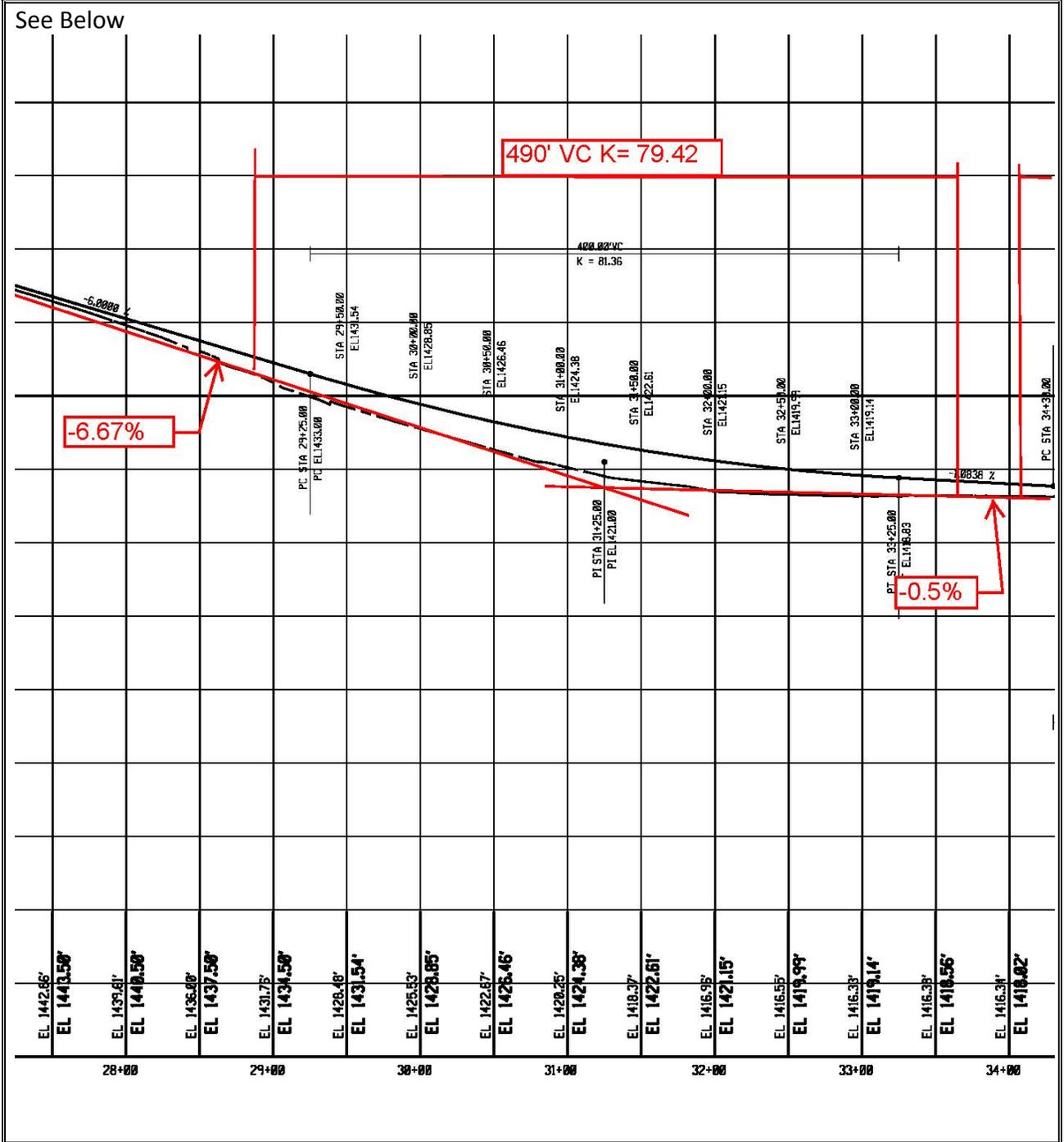
SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. MBP Estimate Database | 6. Vendor (Specify) |
| 3. GDOT Item Mean Summary | 7. Other (Specify) |
| 4. Means Estimating Manual | |

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-4.0 PAGE NUMBER: 3 of 6

PROJECT #/PI #: STP00-0065-02(013) / 621490-

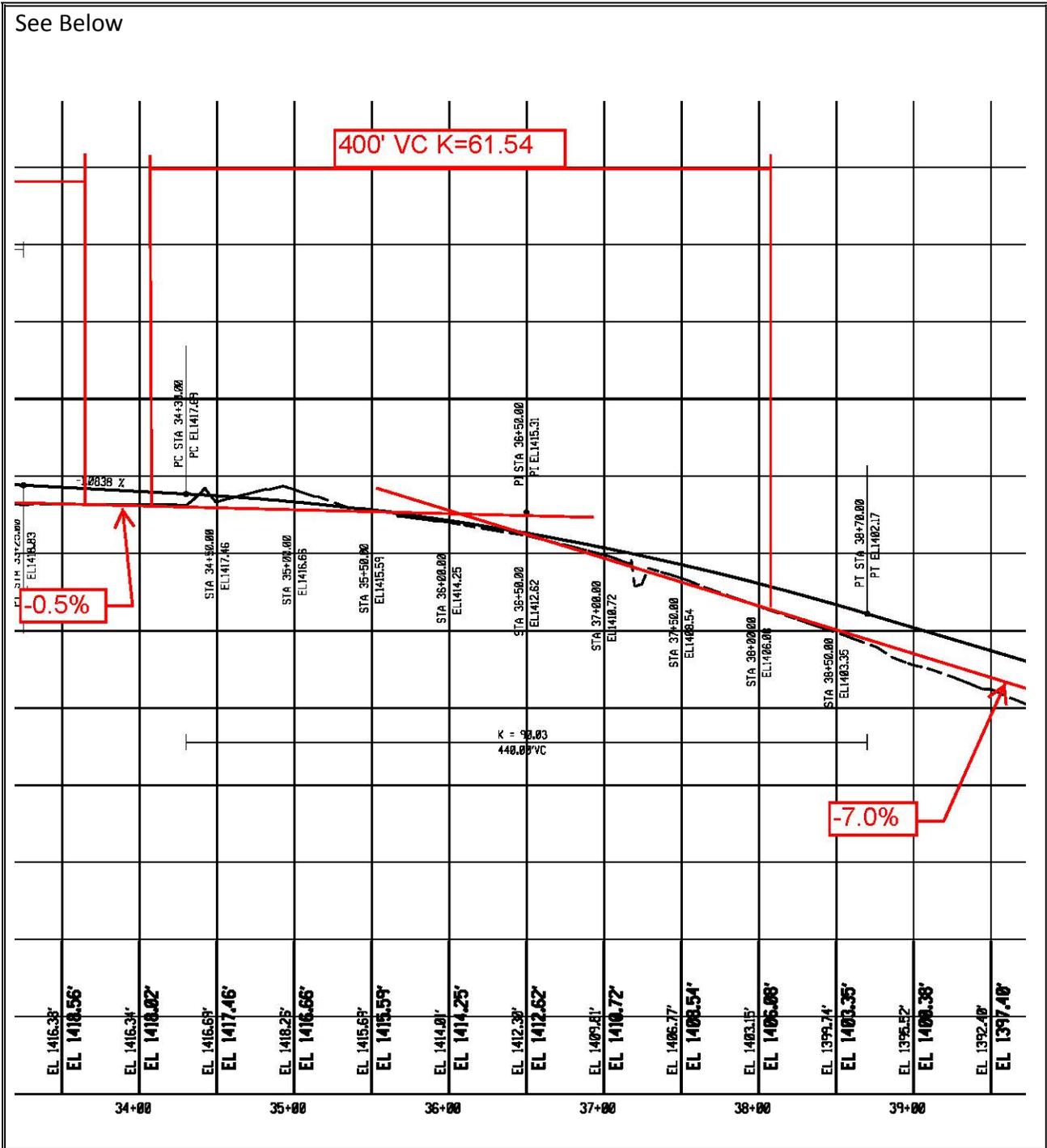


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-4.0 PAGE NUMBER: 4 of 6

PROJECT #/PI #: STP00-0065-02(013) / 621490-

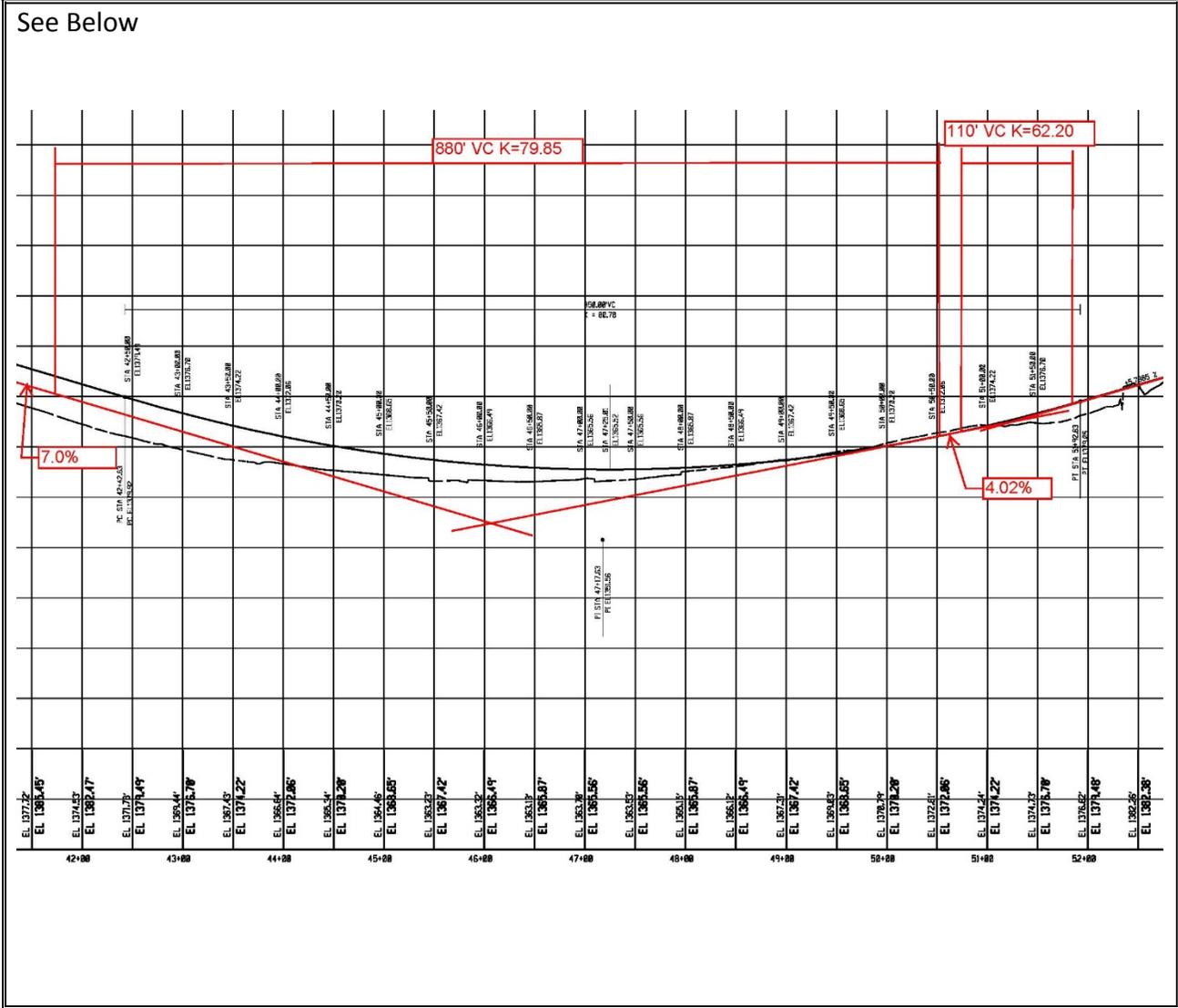
See Below



PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-4.0 **PAGE NUMBER:** 5 of 6

PROJECT #/PI #: STP00-0065-02(013) / 621490-



CALCULATIONS

PROPOSAL NUMBER:	R-4.0	PAGE NUMBER:	6 of 6
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
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Current Design Pavement Cost Calculations for side roads:

310-1101: 10" GAB = 0.56 tons/SY x \$14.31/ton = \$8.05/SY
 402-3121: 330#/sy Asph 25MM = (330#/2000#)(\$52.11/T) = \$8.60/SY
 402-3190: 220#/sy Asph 19MM = (220#/2000#)(\$57.19/T) = \$6.29/SY
 402-3130: 165#/sy Asph 12.5MM = (165#/2000#)(\$65.64/T) = \$5.42/SY
 413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$1.89/gal = \$0.13
 Total pavement cost = **\$28.49/SY**

Commercial R/W Cost Calculations:

\$300,000/ac + 50% counter/condem. = \$450,000/ac for partial property (Prelim. R/W Est)
 \$225,000/ac for permanent easement at 50% of ROW

Residential R/W Cost Calculations:

No residential R/W acquisition identified (1 displacement at \$40,000)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-8.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Reduce Proposed Lane Widths from 12' to 11'
--

ORIGINAL DESIGN: The current design of the new pavement sections includes 12' travel lanes. The design speeds for the project are 45 MPH for the 4-lane divided section and 30 MPH for the new portions of the one-way pairs.

PROPOSED CHANGE: It is proposed to reduce the proposed lane widths from 12' to 11' lanes. For most locations, the basic approach would be to maintain the proposed north edge of pavement and move the south edge in. This change reduces four feet of paving along the proposed four lane section and two feet along both SR 53 BUS East and West until the tie-in with the existing sidewalk section where the paving will consist of overlay of the existing pavement.

JUSTIFICATION: Truck volumes are low at 5% with 45 and 30 MPH design speeds. Also, the horizontal alignment has one minor curve prior to the split. Moving the south edge will reduce the proposed ROW a minimum of 4 to 8 ft. The 11' lane width is acceptable for roadways in this project which are less than 50 MPH with low truck volumes.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Reduces ROW Impacts • Reduces impervious area 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Narrower Lane Width
--	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 656,901	\$	\$ 656,901
PROPOSED CHANGE:	\$ 0	\$	\$ 0
SAVINGS:	\$ 656,901	\$	\$ 656,901

VALUE ENGINEERING TEAM STUDY

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-8.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1	SY	3,593	\$45.06	\$161,901
ROW acquisition (reduction)	1	AC	1.1	\$450,000	\$495,000
SUBTOTAL – COST TO PRIME					\$656,901
MARKUP					--
TOTAL CONTRACT COST					\$656,901

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement	1	SY	0	0	0
ROW	1	AC	0	0	0
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					\$0.00

Difference [Original-Proposed] **\$656,901**

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. MBP Estimate Database | 6. Vendor (Specify) |
| 3. GDOT Item Mean Summary | 7. Other (Specify) |
| 4. Means Estimating Manual | |

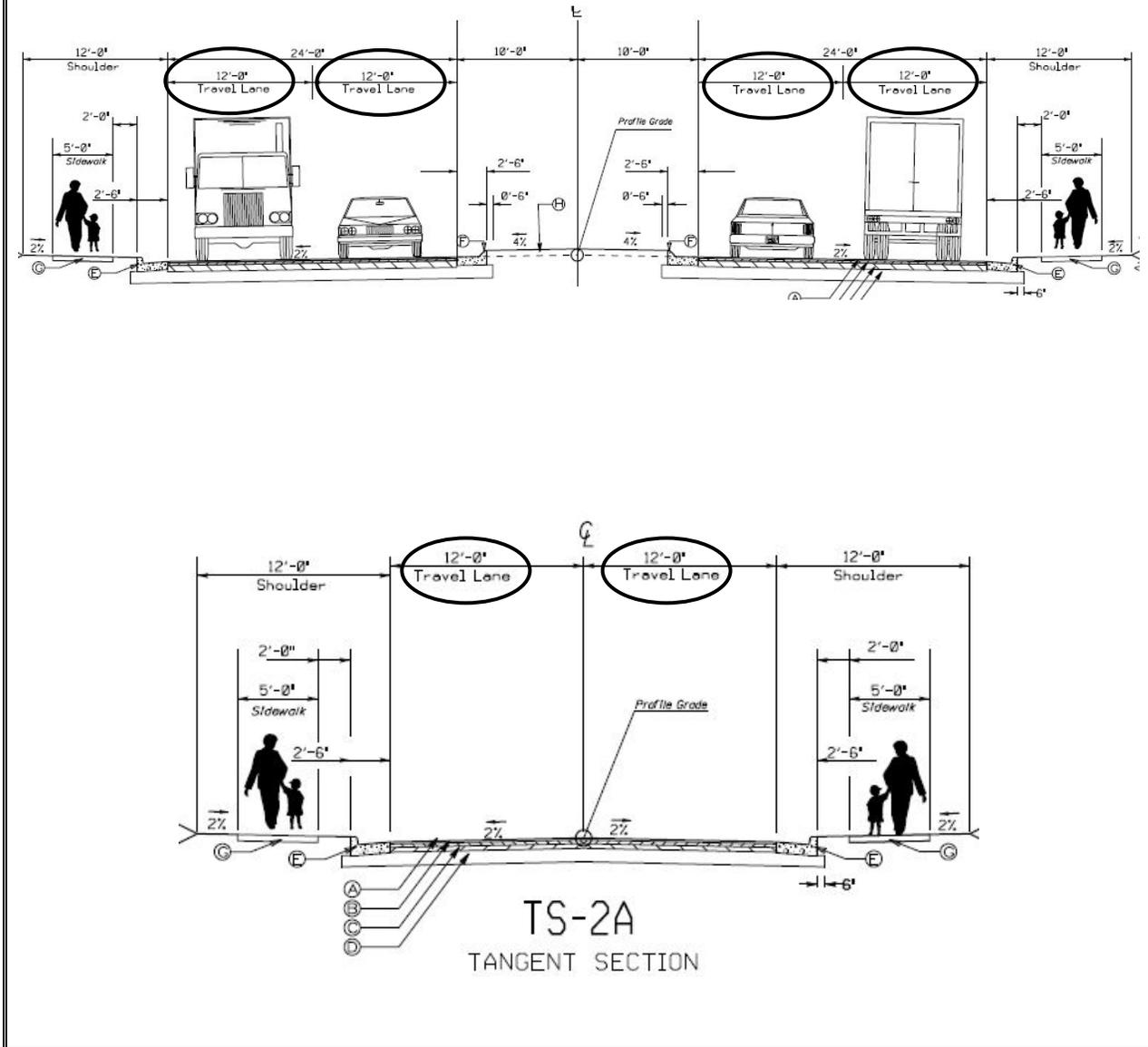
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-8.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Proposed Change: Revise 12'0" lanes to 11'0"



CALCULATIONS

PROPOSAL NUMBER: R-8.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Current Design Pavement Cost Calculations:

310-1101: 9" GAB = 0.51 tons/SY x \$14.31/ton = \$7.30/SY
 402-3121: 990#/sy Asph 25MM = (990#/2,000#)(\$52.11/T) = \$25.79/SY
 402-3190: 220#/sy Asph 19MM = (220#/2,000#)(\$57.19/T) = \$6.29/SY
 402-3130: 165#/sy Asph 12.5MM = (165#/2,000#)(\$65.64/T) = \$5.42/SY
 413-1000: 4 layers tack coat = 0.035 gals/SY/layer x 4 x \$1.89/gal = \$0.26
 Total pavement cost = **\$45.06/SY**

Four Foot reduction From Sta 20+75 to Sta 71+65.73 = 5,091LF x 4FT/9 SF/SY = **2,263 SY**
 Two Foot reduction From Sta 100+00 to Sta 119+88.37 = 1,989LF x 2FT/9SF/SY = **442 SY**
 Two Foot reduction From Sta 200+00 to Sta 239+95 = 3,995LF x 2FT/9SF/SY = **888 SY**

TOTAL = 3,593 SY

R/W Reduction:

Assume 6' R/W reduction on 4-lane and 3' on one-way pairs:

Total Length of 5,091 LF x 6FT = 30,546SF/43,560SF/AC = 0.7AC
 5,984LF x 3FT = 17,952SF/43,560SF/AC = 0.4AC

Commercial R/W Cost Calculations:

\$300,000/ac + 50% counter/condem. = \$450,000/ac for partial property (Prelim. R/W Est)
 \$225,000/ac for permanent easement at 50% of ROW

Residential R/W Cost Calculations:

No residential R/W acquisition identified (1 displacement at \$40,000)

TOTAL = 1.1AC x \$450,000/AC = **\$495,000**

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-10.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Reduce Raised Median Width from 20' to 16'

ORIGINAL DESIGN: The current design of the four-lane typical sections includes a 20-ft raised paved median.

PROPOSED CHANGE: It is proposed to reduce the raised median width to 16 ft. in lieu of 20 ft. This reduction requires a design variance but these have been commonly granted by GDOT in the recent past, especially on projects such as this with no drainage structures in the median.

JUSTIFICATION: Truck volumes are low at 5% with a 45 MPH design speed. Also, the horizontal alignment has one minor curve prior to the split, and due to there being no drainage structures in the median the narrower 16' median should be sufficient.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Reduces ROW Impacts • Reduces impervious area 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Narrower median width at left turn lanes
--	---

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 281,104	\$	\$ 281,104
PROPOSED CHANGE:	\$ 0	\$	\$ 0
SAVINGS:	\$ 281,104	\$	\$ 281,104

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-10.0	PAGE NUMBER: 2 of 4
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Conc. Median (reduction)	1	SY	2,141	\$32.51	\$69,604
ROW acquisition (reduction)	1	AC	0.47	\$450,000	\$211,500
SUBTOTAL – COST TO PRIME					\$281,104
MARKUP					--
TOTAL CONTRACT COST					\$281,104

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement	1	SY	0	0	0
ROW	1	AC	0	0	0
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					\$0.00

Difference [Original-Proposed] **\$281,104**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

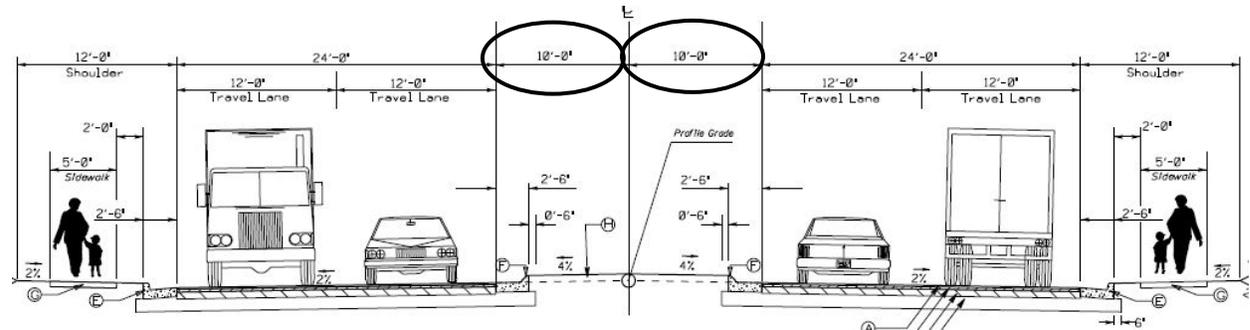
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-10.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Proposed Change: Reduce 20'0" median to 16'0"



CALCULATIONS

PROPOSAL NUMBER: R-10.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Median Length From Sta 25+08 to Sta 28+66 = 358LF
 Sta 29+55 to Sta 35+94 = 639LF
 Sta 30+67 to Sta 42+85 = 1,218LF
 Sta 43+75 to Sta 55+55 = 1,180LF
 Sta 56+45 to Sta 68+15 = 1,170LF
 Sta 69+15 to Sta 71+66 = 251LF

TOTAL = 4816LF x 4FT/9SF/SY = 2,141SY

Commercial R/W Cost Calculations:

\$300,000/ac + 50% counter/condem. = \$450,000/ac for partial property (Prelim. R/W Est)
 \$225,000/ac for permanent easement at 50% of ROW

Commercial R/W Reduction

Total Length From Sta 20+75 to Sta 71+65.73 = 5,091LF x 4FT = 20,364SF/43,560SF/AC = 0.47
 AC

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-11.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Use Existing 48" Storm Drain Pipe (SDP) in Lieu of Replacing with a Proposed 48" SDP from Structure I-12 to I-8

ORIGINAL DESIGN: In the current design, an existing 48" SDP is being replaced with a proposed 48" SDP at Sta 110+55 (Lt) to Sta 113 +45. Also, in the same area a new 18"SDP is being placed from Structure I-10 to I-11.

PROPOSED CHANGE: It is proposed to use the existing 48" SDP and eliminate the new 48" pipe from I-12 to I-8. Route a new 18" SDP from I-10 to I-12 in lieu of I-11, and eliminate the proposed new junction box I-11.

JUSTIFICATION: An Existing 48" SDP is currently in place. Continue to use the existing pipe in lieu of replacing it.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Reduces time/staging 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Existing pipe may need flushing/maintenance to achieve full capacity.
--	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 37,567	\$	\$ 37,567
PROPOSED CHANGE:	\$ 2,027	\$	\$ 2,027
SAVINGS:	\$ 35,540	\$	\$ 35,540

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-11.0	PAGE NUMBER: 2 of 4
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
48" SDP	1	LF	390	\$85.82	\$33,469
18" SDP	1	LF	22	\$27.02	\$595
Junction Box	1	EA	1	\$1,780	\$1,780
Stone Dumped Rip Rap TP 3	1	SY	42	\$41.02	\$1,723
SUBTOTAL – COST TO PRIME					\$37,567
MARKUP					--
TOTAL CONTRACT COST					\$37,567

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
18" SDP	1	LF	75	\$27.02	\$2,027
SUBTOTAL – COST TO PRIME					\$2,027
MARKUP					--
TOTAL CONTRACT COST					\$2,027

Difference [Original-Proposed] **\$35,540**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

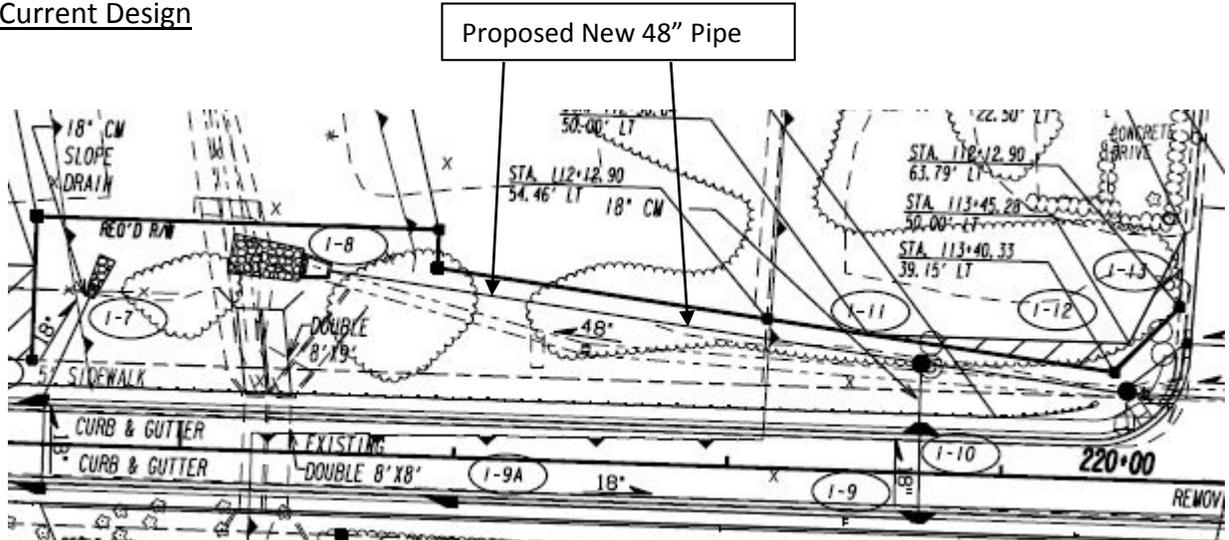
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-11.0

PAGE NUMBER: 3 of 4

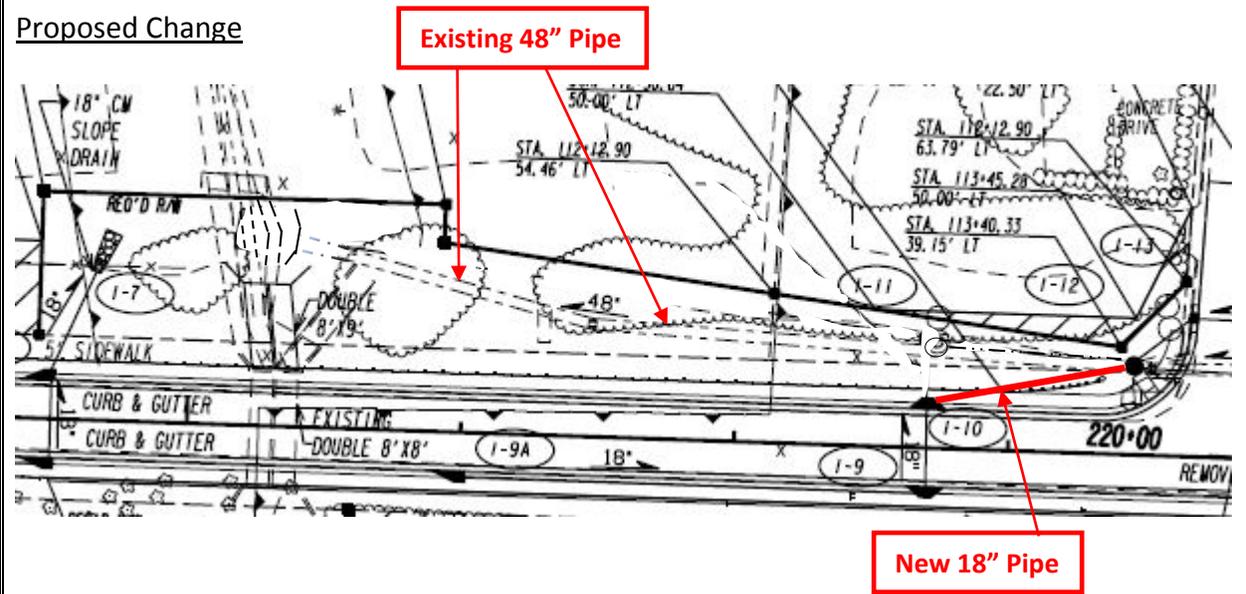
PROJECT #/PI #: STP00-0065-02(013) / 621490-

Current Design



Proposed Change: Utilize the existing 48" pipe in lieu of placing new pipe from I-12 to I-8. Route new 18" pipe from I-10 to I-12 and eliminate new junction box I-11.

Proposed Change



CALCULATIONS

PROPOSAL NUMBER: R-11.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

48" SDP listed in cost estimate is 390LF

18" SDP from I-10 to I-11 is 22LF

18' SDP from I-10 to I-12 is 75LF Additional Length needed is 53LF

Rip Rap – $25' \times 15' = 375SF/9SF/SY = 42SY$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-12.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Eliminate Wall # 8 and Slope to Existing Grade.

ORIGINAL DESIGN: The current design includes a Type P3 Retaining Wall (Wall #8) from Sta 109+50 to Sta 114+15. This is located adjacent to the existing football/soccer field at the Middle School; however the edge of those fields are approximately 100 feet from the proposed wall.

PROPOSED CHANGE: It is proposed to eliminate Wall #8, install a guardrail and slope to existing grade. Additional Easement will be required.

JUSTIFICATION: Due to the existing football/soccer field being more than 100' from the proposed wall, the wall can be eliminated and a 2:1 slope installed without adversely affecting the field.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Maintenance of wall is eliminated 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Maintenance of the guardrail and 2:1 slope on School property will be required.
---	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 243,646	\$	\$ 243,646
PROPOSED CHANGE:	\$ 43,557	\$	\$ 43,557
SAVINGS:	\$ 200,089	\$	\$ 200,089

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-12.0	PAGE NUMBER: 2 of 5
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
P3 Retaining Wall	1	LF	465	\$523.97	\$243,646
SUBTOTAL – COST TO PRIME					\$243,646
MARKUP					--
TOTAL CONTRACT COST					\$243,646

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
ROW Easement	1	AC	0.1	\$225,000	\$22,500
Borrow Excavation	1	CY	2,204	\$5.82	\$12,827
Guardrail, TP W	1	LF	465	15.01	\$6,980
GR Anchorage, TP 1	1	EA	2	625	\$1,250
SUBTOTAL – COST TO PRIME					\$43,557
MARKUP					--
TOTAL CONTRACT COST					\$43,557

Difference [Original-Proposed] **\$200,089**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

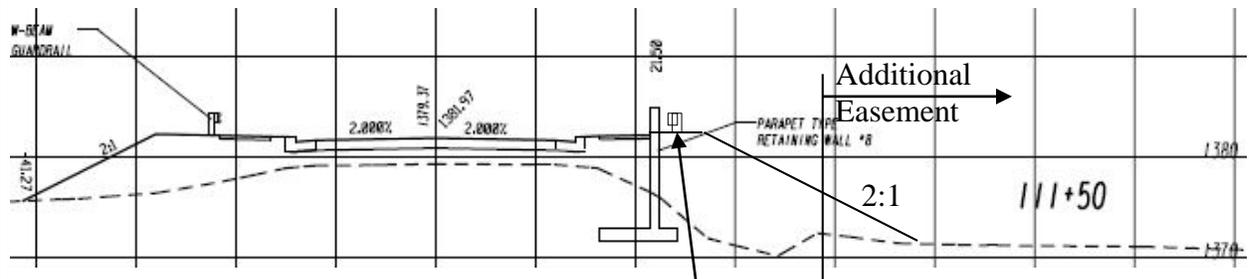
PROPOSAL NUMBER: R-12.0

PAGE NUMBER: 3 of 5

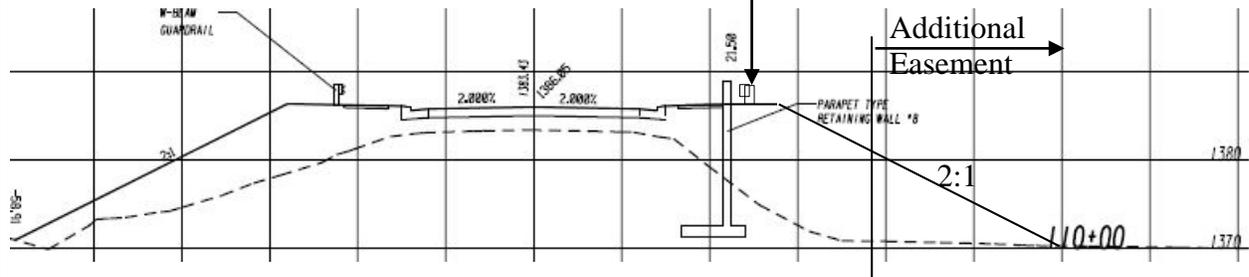
PROJECT #/PI #: STP00-0065-02(013) / 621490-

Example Cross Sections

Proposed Change: Eliminate Wall #8, install guardrail and Slope 2:1 to Existing Grade



Eliminate wall and install guardrail



CALCULATIONS

PROPOSAL NUMBER: R-12.0

PAGE NUMBER: 4 of 5

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Earthwork Calculations

109+00	0		
		0	$x50/2 = 0$
109+50	0		
		260	$x50/2 = 6,500$
110+00	260		
		480	$x50/2 = 12,000$
110+50	220		
		390	$x50/2 = 9,750$
111+00	170		
		320	$x50/2 = 8,000$
111+50	150		
		260	$x50/2 = 6,500$
112+00	110		
		180	$x50/2 = 4,500$
112+50	70		
		150	$x50/2 = 3,750$
113+00	80		
		150	$x50/2 = 3,750$
113+50	70		
		130	$x50/2 = 3,250$
114+00	60		
		60	$x50/2 = 1,500$
114+50	0		

59,500CF/27CF/CY = 2,204CY

CALCULATIONS

PROPOSAL NUMBER: R-12.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ROW Calculations

109+00	0		
		0	$x50/2 = 0$
109+50	0		
		22	$x50/2 = 550$
110+00	22		
		40	$x50/2 = 1,000$
110+50	18		
		30	$x50/2 = 750$
111+00	12		
		22	$x50/2 = 550$
111+50	10		
		18	$x50/2 = 450$
112+00	8		
		14	$x50/2 = 350$
112+50	6		
		12	$x50/2 = 300$
113+00	6		
		10	$x50/2 = 250$
113+50	4		
		4	$x50/2 = 100$
114+00	0		
		0	
114+50	0		

$4,300SF/43,560SF/AC = 0.1AC$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-16.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Utilize Concrete Header Curb in Lieu of Gravity Wall #12 and Slope to Proposed Sidewalk.

ORIGINAL DESIGN: In the current design, a proposed gravity wall (Wall #12) is shown from Sta 236+15 to Sta 237+65 on the Eastbound one-way pair.

PROPOSED CHANGE: It is proposed to use concrete header wall in lieu of Wall #12 and then slope to proposed sidewalk. Additional ROW or easement will not be required.

JUSTIFICATION: There is no apparent need for a gravity wall in this location since the excavation is up to one foot. It is proposed to utilize a concrete header curb and slope to sidewalk.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Maintenance of wall is eliminated 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Curb is in a church parking lot and could be driven over.
---	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 16,922	\$	\$ 16,922
PROPOSED CHANGE:	\$ 2,810	\$	\$ 2,810
SAVINGS:	\$ 14,122	\$	\$ 14,122

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-16.0	PAGE NUMBER: 2 of 4
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Gravity Wall	1	CY	112	\$151.09	\$16,922
SUBTOTAL – COST TO PRIME					\$16,922
MARKUP					--
TOTAL CONTRACT COST					\$16,922

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Conc. Header Curb Tp 4	3	LF	150	\$18.73	\$2,810
SUBTOTAL – COST TO PRIME					\$2,810
MARKUP					--
TOTAL CONTRACT COST					\$2,810

Difference [Original-Proposed] **\$14,112**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

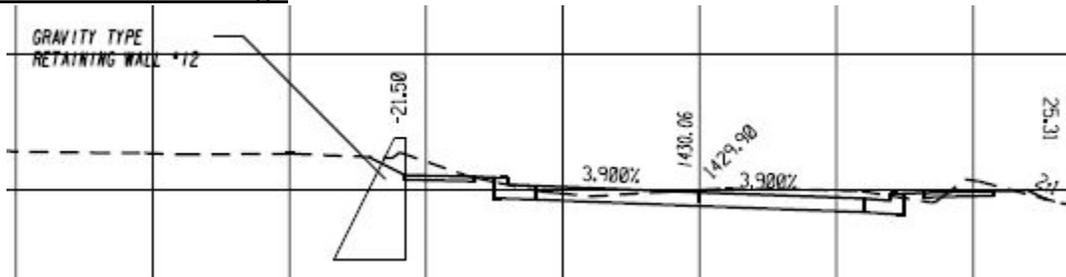
PROPOSAL NUMBER: R-16.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

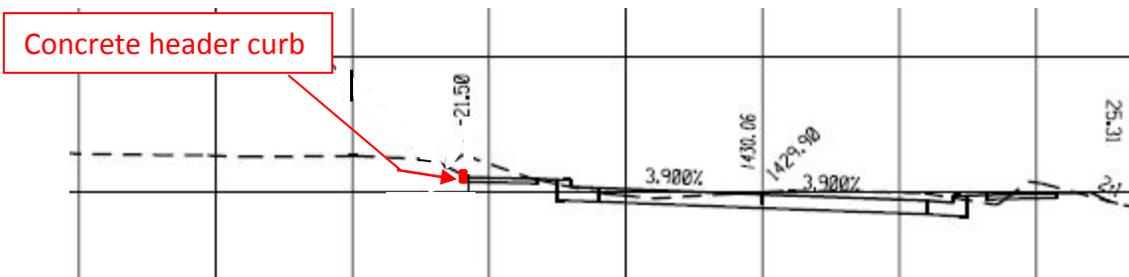
Example Cross Sections

Sta 236+50 – Current Design



Sta 236+50 – Proposed Change

Proposed Change: Eliminate Wall #12 and Utilize Concrete Header Curb



CALCULATIONS

PROPOSAL NUMBER: R-16.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Gravity Wall

Sta 236+15 to Sta 237+65 = 150LF x 20SF/27CF/CY = 112CY

Header Curb

Sta 236+15 to Sta 237+65 = 150LF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-19.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Reduce Improvements to Holly Street

ORIGINAL DESIGN: In the current design, proposed improvements to Holly Street begin at Sta 232+50 and end at Sta 245+00 for a distance of 1,250 LF.

PROPOSED CHANGE: It is proposed to begin work on Holly Street at Sta 233+75 and end work at Sta 242+00. The existing approach grade is -11.56% and would be increased to -12.02% and then an exiting grade of -5.80% as it approaches the proposed intersection with SR 53 Bus Westbound. After the intersection an approach grade of -3.86% will meet an exiting grade of +7.08% to tie into the existing roadway at Sta 242+00. A grade of 11% for rural two-lane roads is allowable with an additional 1% for short distances and low ADT. The 12.02% grade is for 250-ft. The proposed change will reduce 425 LF of milling and overlay along the existing road.

JUSTIFICATION: The ADT provided for Holly Street assumes the Jasper Middle School remaining in place. If the existing school is re-purposed to an admin building, the ADT will be reduced. Existing Holly Street has very steep grades.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Cost • Eliminates unnecessary work 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Steep down grade leading to stop condition.
---	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 8,749	\$	\$ 8,749
PROPOSED CHANGE:	\$ 0	\$	\$
SAVINGS:	\$ 8,749	\$	\$ 8,749

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-19.0	PAGE NUMBER: 2 of 4
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Milling	1	SY	1,039	\$3.00	\$3,117
Overlay	1	SY	1,039	\$5.42	\$5,632
SUBTOTAL – COST TO PRIME					\$8,749
MARKUP					--
TOTAL CONTRACT COST					\$8,749

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					0.00

Difference [Original-Proposed] **\$8,749**

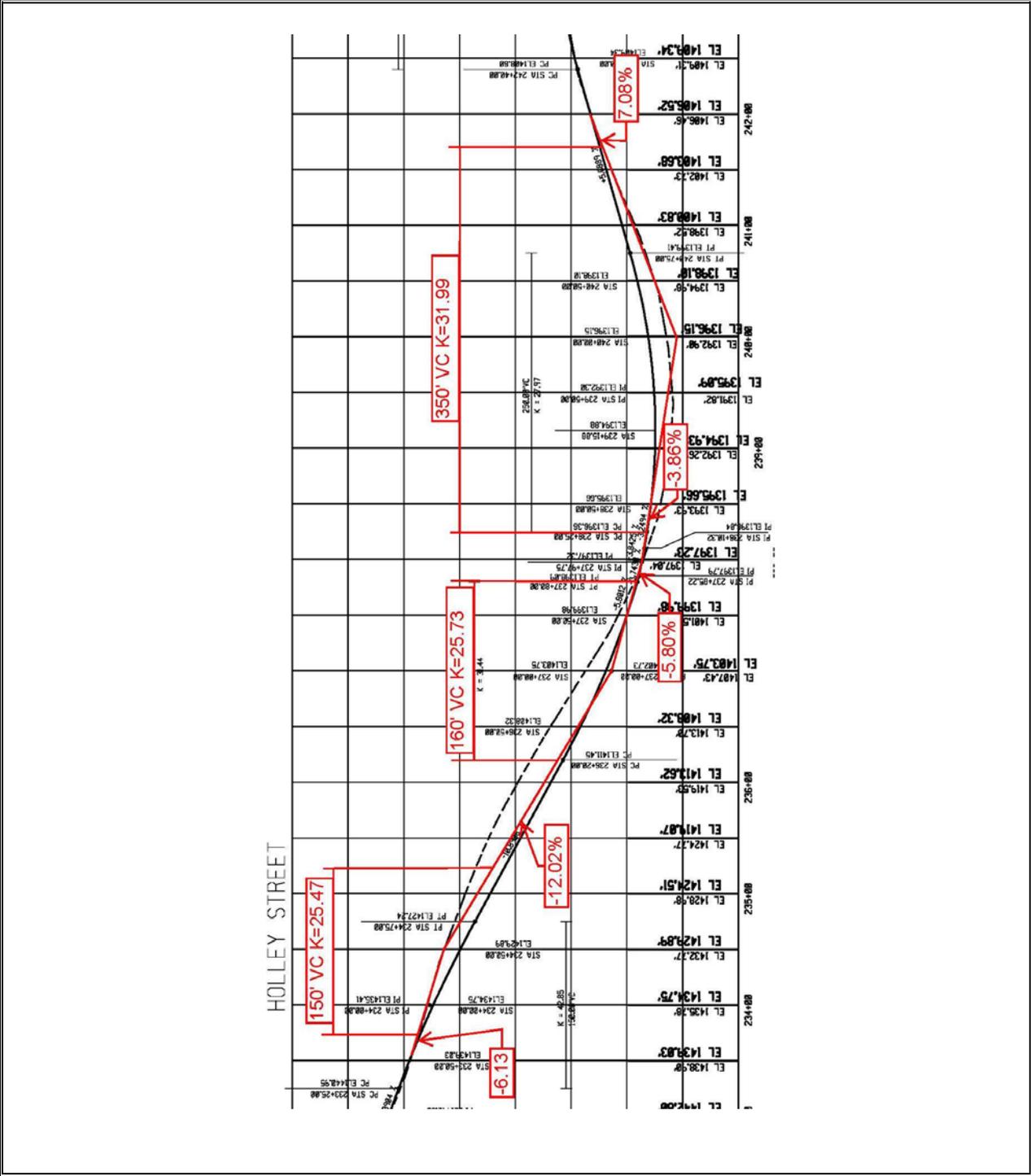
SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-19.0 PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-



CALCULATIONS

PROPOSAL NUMBER: R-19.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Current Design Pavement Cost Calculations:

402-3130: $165\#/sy \text{ Asph } 12.5MM = (165\#/2,000\#)(\$65.64/T) = \$5.42/SY$

Sta 232+50 to Sta 233+75 = 125LF reduction

Sta 242+00 to Sta 245+00 = 300LF reduction

$425LF \times 22FT/9SF/SY = 1,039 \text{ SY total area reduction}$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-20.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Limit Improvements West of SR 515 to only Right Turn Lane Taper from SR 53 to SR 515 Southbound

ORIGINAL DESIGN: In the current design, the intersection of SR 53 and SR 515 is designed for dual left turning lanes in both the east and west bound approaches. The need for dual left turn lanes was based on traffic counts in 2006-2008. The left turning vehicles from SR 53 eastbound to SR 515 northbound in the peak hour are 88 vehicles per hour (VPH) in the PM and 35 VPH in the AM. The left turning vehicles from SR 53 westbound to SR 515 southbound in the peak hour are 215 VPH in the PM and 165 VPH in the AM.

PROPOSED CHANGE: Based on the recent updated traffic counts, it is proposed to reduce the dual left turning lanes in both directions to one left turning lane and limit construction on the west side of SR 515 to only extending the right turn lane from SR 53 onto SR 515 southbound.

JUSTIFICATION: As a result of the updated traffic numbers, dual left turning lanes that were part of the initial design are no longer warranted per the GDOT Regulations for Driveway & Encroachment Manual section 4.9.5. This criteria is based on the Highway Capacity Manual published by the Transportation research Board which suggests that the following criteria can be used to estimate the number of lanes needed for the left-turn movement:

- Provide one or more exclusive lanes, if a left turn phase is provided;
- Provide one exclusive lane, if 100 VPH < left turn demand < 300 VPH;
- Provide two exclusive lanes if the left turning demand > 300 VPH

The intersection will be more efficient in the off peak hours without the dual lefts, as the left turn movements will be permissive or protected permissive movements. As designed, dual left turn movements must operate in protected-only mode, requiring both additional green time to be taken away from the main street and higher cycle lengths during off-peak timing plans.

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> • Reduces Costs • Reduces Maintenance • Reduces Impacts 	<ul style="list-style-type: none"> • Some additional queueing for left turns

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 288,306	\$	\$ 288,306
PROPOSED CHANGE:	\$ 0	\$	\$ 0
SAVINGS:	\$ 288,306	\$	\$ 288,306

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-20.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Concrete Curb & Gutter, 6" X 30" TP 2 (441-6022) - reduction	1	LF	1,290	\$14.09	\$18,177
Asphalt (reduction)	1	SY	5,800	\$45.06	\$261,348
Permanent Easement (reduction)	1	AC	0.04	\$225,000	\$8,781
SUBTOTAL – COST TO PRIME					\$288,306
MARKUP					--
TOTAL CONTRACT COST					\$288,306

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
MARKUP					--
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$288,306**

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. MBP Estimate Database | 6. Vendor (Specify) |
| 3. GDOT Item Mean Summary | 7. Other (Specify) |
| 4. Means Estimating Manual | |

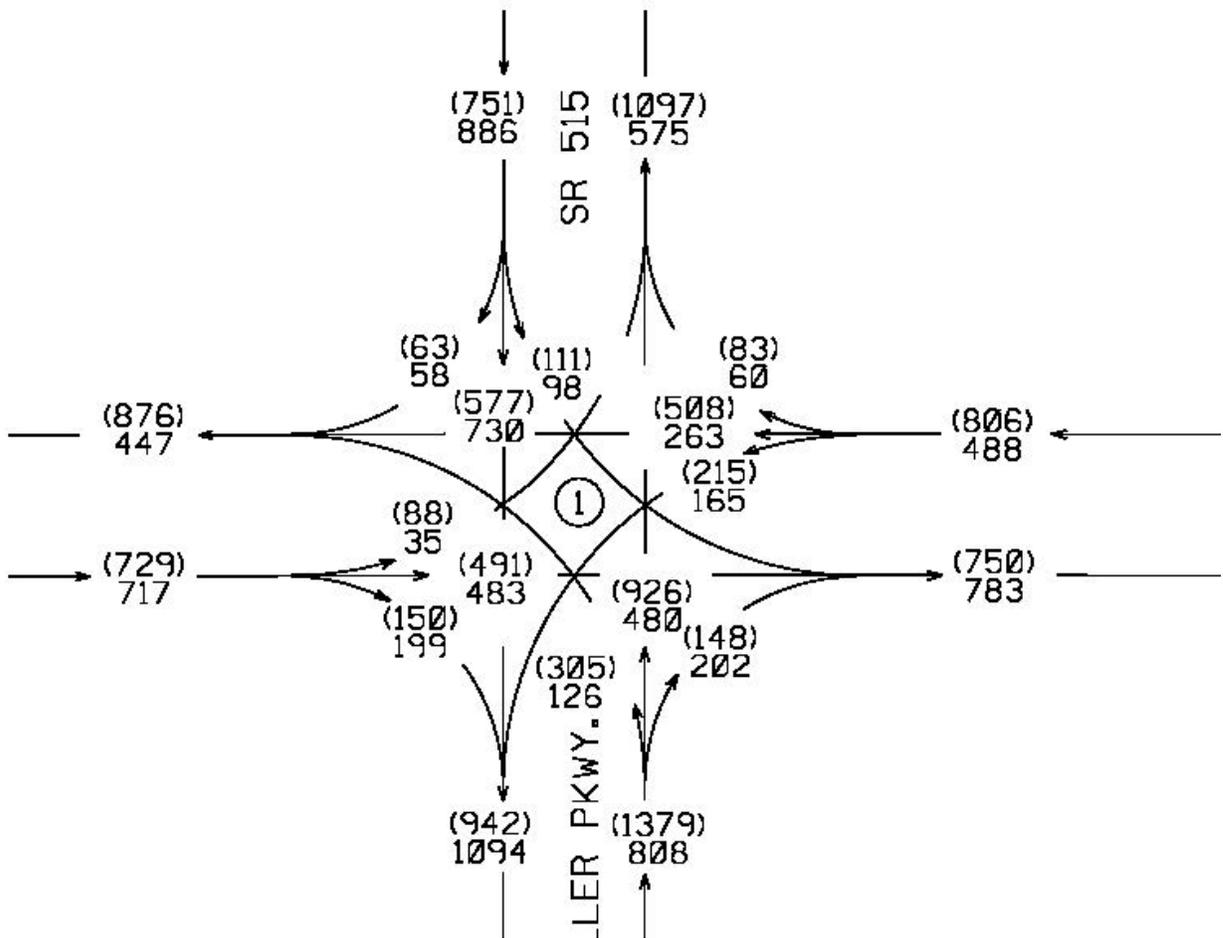
ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-20.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Build Volumes (DHV's) at Intersection of SR 53 and SR 515 – AM volume (PM volume)



CALCULATIONS

PROPOSAL NUMBER: R-20.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

West of SR 515 Pavement Area = $800 \times 60 = 48,000 \text{ SF}/9 = 5,333 \text{ SY}$
 Eliminate left-turn storage: Pavement Area = $350 \times 12 = 4,200 \text{ SF}/9 = 467 \text{ SY}$
 Total pavement reduction = 5,800 SY

Current Design Pavement Cost Calculations:

310-1101: 9" GAB = $0.51 \text{ tons/SY} \times \$14.31/\text{ton} = \$7.30/\text{SY}$
 402-3121: $990\#/sy \text{ Asph } 25\text{MM} = (990\#/2,000\#)(\$52.11/\text{T}) = \$25.79/\text{SY}$
 402-3190: $220\#/sy \text{ Asph } 19\text{MM} = (220\#/2,000\#)(\$57.19/\text{T}) = \$6.29/\text{SY}$
 402-3130: $165\#/sy \text{ Asph } 12.5\text{MM} = (165\#/2,000\#)(\$65.64/\text{T}) = \$5.42/\text{SY}$
 413-1000: 4 layers tack coat = $0.035 \text{ gals/SY/layer} \times 4 \times \$1.89/\text{gal} = \$0.26$
 Total pavement cost = **\$45.06/SY**

Commercial R/W Cost Calculations:

$\$300,000/\text{ac} + 50\% \text{ counter/condem.} = \$450,000/\text{ac}$ for partial property (Prelim. R/W Est)
 $\$225,000/\text{ac}$ for permanent easement at 50% of ROW

Residential R/W Cost Calculations:

No residential R/W acquisition identified (1 displacement at \$40,000)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-21.0	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Eliminate Sidewalk on Eastbound Pair from Split to Holly Street

ORIGINAL DESIGN: In the current design, there are sidewalks on both sides of the road in the new location section of SR 53 eastbound.

PROPOSED CHANGE: It is proposed to remove sidewalk from the two-way split to Holly Street on the north and south side of SR 53 eastbound.

JUSTIFICATION: This new section of roadway will likely not have much pedestrian activity. Pedestrians from the school going West will exit the North side of the school and go West along the sidewalks on the Westbound portion of the one-way pairs. The Eastbound pair from the split to Holly Street passes through an agricultural property with no development – the sidewalks could be constructed in the future should this route be developed.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Costs • Reduces Maintenance • Reduces impervious area 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • Lack of Pedestrian Accommodations
---	--

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 50,685	\$	\$ 50,685
PROPOSED CHANGE:	\$	\$	\$
SAVINGS:	\$ 50,685	\$	\$ 50,685

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-21.0	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Conc Sidewalk, 4 in (441-0104)	1	SY	2,445	\$20.73	\$50,685
SUBTOTAL – COST TO PRIME					\$50,685
MARKUP					--
TOTAL CONTRACT COST					\$50,685

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
MARKUP					--
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$50,685**

SOURCES

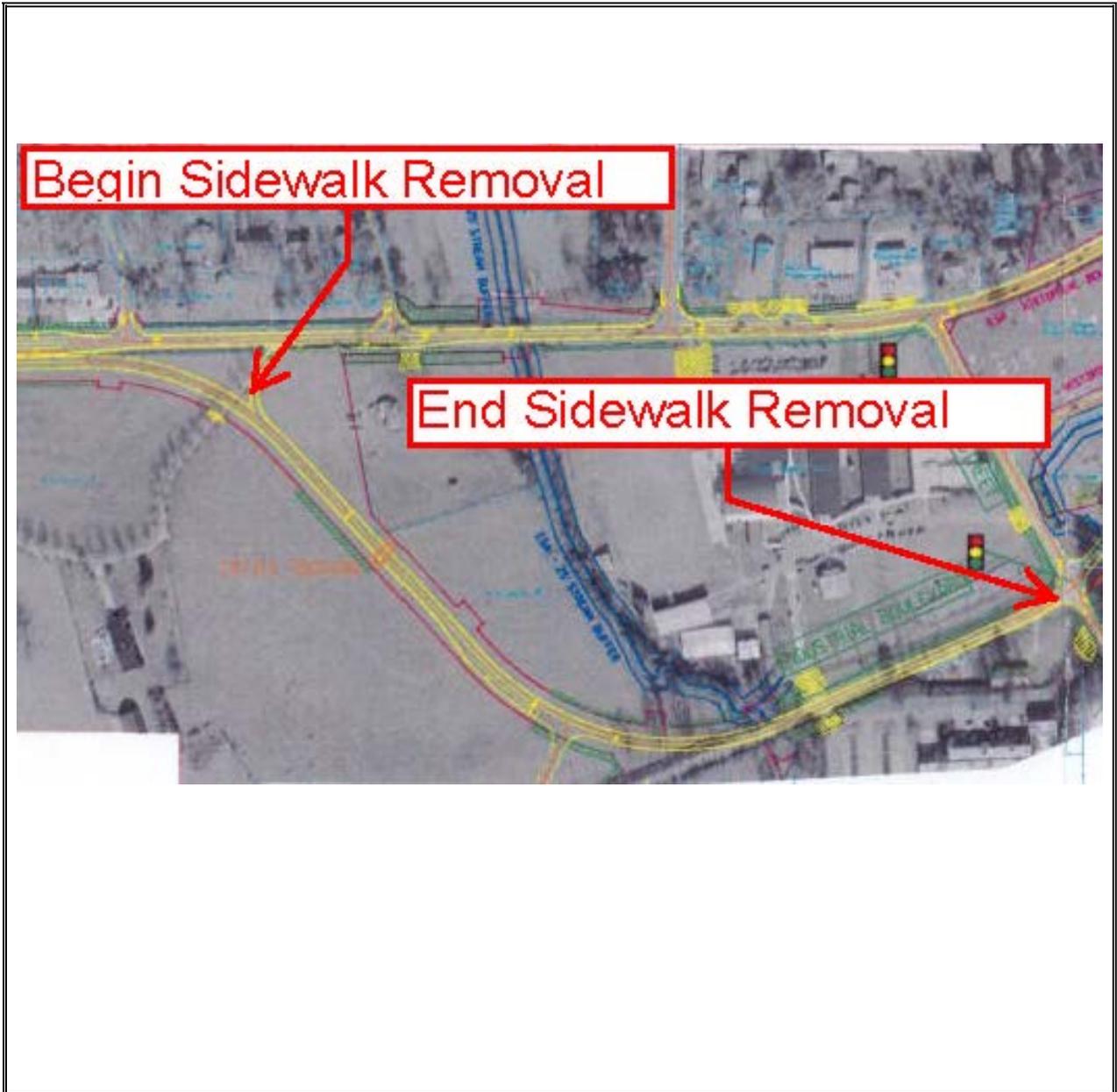
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-21.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-



CALCULATIONS

PROPOSAL NUMBER: R-21.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Sidewalk Removal from Sta 205+00 to Sta 227+00 = 2,200 LF x 2 sides x 5 feet = 22,000 SF
22,000 SF/9 = 2,445

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-22.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	STP00-0065-02(013) / 621490-
PROJECT TITLE:	SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd Pickens County

PROPOSAL DESCRIPTION: Eliminate Signals at Holly Street and Bryant Street

ORIGINAL DESIGN: In the current design, the intersection at Bryant Street and SR 53 has a proposed signal. Also the intersections at Holly Street and both of the new one-way pairs have a proposed signal. The need for signals at these locations was based on traffic counts in the 2006 timeframe. Updated traffic counts were obtained earlier this year.

PROPOSED CHANGE: Based on the recent updated traffic counts (see design hourly volumes on the sketch pages), it is proposed to remove the signals at Bryant Street at SR 53, Holly Street at SR 53 westbound and Holly Street at SR 53 eastbound.

JUSTIFICATION: As a result of the updated traffic numbers, signals are no longer warranted. For installation of a traffic signal, GDOT requires the eight-hour volume warrants in the Manual on Uniform Traffic Control Devices be satisfied at the 100% volume threshold. GDOT policy does not allow the option in the MUTCD that would consider the main street left turning volume be considered as the side street volume. Holly Street and Bryant Circle will function as the side street approaches and SR 53 BU will function as the main street. In order to satisfy the lowest 100% volume threshold, the highest side street combination of throughs and lefts must meet or exceed at least 75 vehicles for eight hours of the day to satisfy the minimum GDOT requirements for installation of a traffic signal. For SR 53 BU East, we have 84 vehicles in the morning peak and 109 vehicles in the evening peak, and for SR 53 BU West we have 55 vehicles in the morning peak and 120 vehicles in the evening peak. It is very unlikely that Holly Street will have the minimum sustained volume to satisfy the 100% volume warrants for SR 53 BU East. Holly Street won't have the minimum sustained volume at SR 53 BU West since the morning peak does not exceed the threshold. Neither peak hour volumes on Bryant Circle meet the threshold, and GDOT does not allow the main street left turn movement to be considered as a side street for the satisfaction of volume warrants.

<p>ADVANTAGES:</p> <ul style="list-style-type: none"> • Reduces Costs & Maintenance • Improves Operations 	<p>DISADVANTAGES:</p> <ul style="list-style-type: none"> • No longer signalized
--	---

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 240,000	\$	\$ 240,000
PROPOSED CHANGE:	\$ 0	\$	\$ 0
SAVINGS:	\$ 240,000	\$	\$ 240,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-22.0	PAGE NUMBER: 2 of 4
--------------------------------	----------------------------

PROJECT #/PI #: STP00-0065-02(013) / 621490-

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Traffic Signal (647-1000) - reduction	1	LS	3	\$80,000	\$240,000
SUBTOTAL – COST TO PRIME					\$240,000
MARKUP					--
TOTAL CONTRACT COST					\$240,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
MARKUP					--
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$240,000**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. MBP Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

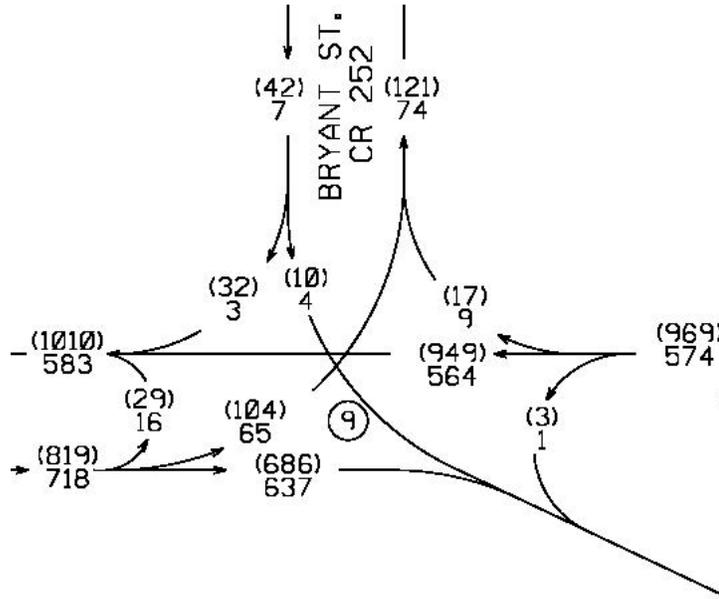
ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-22.0

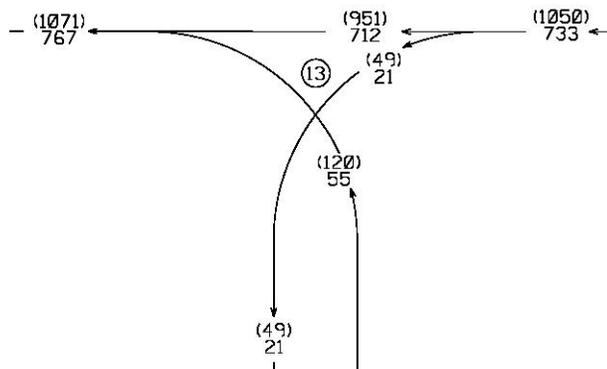
PAGE NUMBER: 3 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Build Volumes (DHV's) at Intersection of SR 53 and Bryant Street – AM volume (PM volume)



Build Volumes (DHV's) at Intersection of Holly Street and SR 53 Westbound – AM (PM)



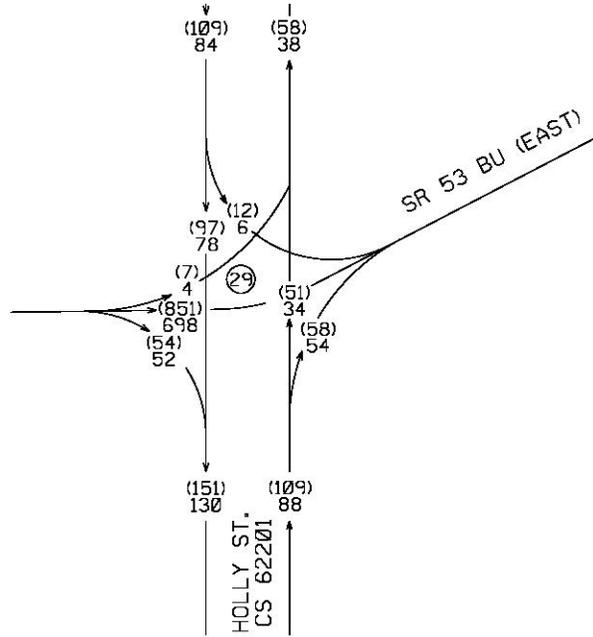
ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-22.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: STP00-0065-02(013) / 621490-

Build Volumes (DHV's) at Intersection of Holly Street and SR 53 Eastbound – AM (PM)



VALUE ENGINEERING TEAM STUDY

VE ANALYSIS SIGN-IN SHEET

Project No.: STP00-0065—02(013) County: Pickens PI No.: 621490-

Date: May 9-12, 2016

Days

FIRST	LAST	NAME	GDOT OFFICE OR COMPANY NAME	PHONE NUMBER	EMAIL ADDRESS
X	X	Lisa L. Myers	Engineering Services	404-631-1770	lmyers@dot.ga.gov
X	X	Matt Sanders	Engineering Services	404-631-1752	msanders@dot.ga.gov
X	O	Christopher Raymond	Traffic Operations	404-635-2814	cdraymond@dot.ga.gov
X	X	Albert Shelby	Program Delivery	404-631-1758	ashelby@dot.ga.gov
X	O	Kenny Beckworth	D6 Construction	770-387-3609	kbeckworth@dot.ga.gov
X	X	Jeff Simmons	Program Delivery	404-631-1525	jesimmons@dot.ga.gov
X	O	Aaron Burgess	Environmental Services	404-631-1159	aburgess@dot.ga.gov
X	X	Tom Orr	MBP	404-869-6301	torr@mbpce.com
X	X	Scott Jordan	Southeastern Engineering	404-670-2040	sjordan@seengineering.com
X	X	Dom Saulino	RS&H	678-528-7219	dominic.saulino@rsandh.com
X	O	Mike Rushing	Kimley-Horn	678-533-3925	mike.rushing@kimley-horn.com
X	X	Daveitta Jenkins	CH2M	678-530-4789	daveitta.jenkins@ch2m.com
X	O	Melanie Wiggins	CH2M	678-530-4387	melanie.wiggins@ch2m.com
O	X	Gary Newton	Kimley-Horn	678-533-3902	gary.newton@kimley-horn.com
O	X	Kimberly Nesbitt	Program Delivery	404-631-1575	knesbitt@dot.ga.gov

Place an "**X**" for all who attend "**O**" = Did Not Attend 13 Attended Project Overview (Day 1) 10 Attended Project Presentation (Day 4)

FUNCTION ANALYSIS

The following functions for the SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd. project were identified during discussions with the VE participants on the first day of the study. These two-word functions consist of an active verb, and a quantifiable (measurable) noun. The functions represent the proposed capital improvement expenditures of the project, and assist the VE Team in becoming familiar with the needs and long-term goals for the project. The Basic Function of the project is to “Reduce Congestion”. The following are considered by the VE Team to be Secondary and Supporting Functions.

Verb	Noun	Verb	Noun
Accommodate	Pedestrians	Reduce	Crash Frequency
Control	Access	Minimize	Impacts
Support	Commerce	Improve	Operations
Maintain	Access	Convey	Water
Protect	Environment	Re-establish	Vegetation
Reduce	Delays	Award	Contract
Stimulate	Growth	Control	Erosion
Direct	Traffic	Control	Traffic
Direct	Flow	Protect	Property
Separate	Traffic	Maintain	Sight Distance
Maintain	Traffic	Inform	Traveler
Correct	Deficiencies	Retain	Earth
		Excavate	Earth

COST MODEL

COST MODEL/DISTRIBUTION

Project # STP00-0065-02(013) PI No. 621490-

**SR 53 Bu from SR 515/APD to CR 243/Industrial Blvd
Pickens County, Georgia**

ITEM	COST \$	% OF TOTAL
RIGHT-OF-WAY	10,094,000	44.45%
ASPHALT CONCRETE PAVING	4,554,275	20.06%
RETAINING WALLS	1,761,590	7.76%
AGGREGATE BASE COURSE	1,275,578	5.62%
DRAINAGE SYSTEM	885,059	3.90%
CONCRETE SLABS/APRONS/MEDIANS	675,896	2.98%
CURB & GUTTER	582,496	2.57%
SIGNALS	562,132	2.48%
CLEARING AND GRUBBING	495,000	2.18%
EARTHWORK	441,442	1.94%
GRASSING/EROSION CONTROL	408,689	1.80%
TRAFFIC CONTROL	292,757	1.29%
SIDEWALKS	285,171	1.26%
SIGNAGE/MARKING	251,878	1.11%
GUARDRAILS	77,694	0.34%
FIELD OFFICE	64,593	0.28%
BRIDGES/STRUCTURES	0	0.00%
DEMOLITION	0	0.00%
FENCING	0	0.00%
LIGHTING	0	0.00%
LANDSCAPING	0	0.00%
*TOTAL - PROJECT	22,708,249	100.00%

*Does not include Engrg & Inspection, Fuel Adjustment, Liquid AC Adjustment or Utility Relocation

BRAINSTORMING/SPECULATION IDEAS

NO.	IDEA	*Ranking
	ROADWAY (R)	
1.0	Relocate One-way Pair Split to Begin at Mary Street Intersection	5
1.1	Extend 4-Lane Section East to Holly Street and Utilize Roundabout at Intersection	3
1.2	Move Eastbound One-Way Pair to North, Closer to School	2
1.3	Move Eastbound One-Way Pair to North Along Stegall Drive	3
1.4	Utilize Eastbound Pair Route as a 4-Lane Bypass	1
2.0	Eliminate Pedestrian Improvements on Eastbound Pair from Holly Street Eastward	3
3.0	Shift Vertical Alignment Closer to Existing on Westbound Pair from Sta 107+00 to 114+00	4
4.0	Shift Vertical Alignment Closer to Existing on 4-Lane Section from Sta 27+00 to 53+00	4
5.0	Shift Horizontal Alignment on 4-Lane Section Northward from Sta 32+36 to the East	Drop
6.0	Eliminate Widening of Bryant Street and Only Include Required Work for Tie-in	3
7.0	Limit Improvements on Gordon Road to Only that Required for Tie-in	3
8.0	Reduce Lane Widths from 12' to 11'	4
9.0	Reduce Curb and Gutter Width from 30" to 24"	3
10.0	Reduce Raised Median Width from 20' to 16'	4
11.0	Use Existing 48" Storm Drain Pipe (SDP) in Lieu of Replacing with a Proposed 48" SDP from Structure I-12 to I-8	4
12.0	Eliminate Wall #8 and Slope to Existing Grade	4
13.0	Eliminate or Reduce Wall #11 and Slope to Existing Grade	3
14.0	Extend Wall #3 to East in lieu of Acquiring Easement	3
15.0	Eliminate or Reduce Easement Acquisition Behind Wall #4	3
16.0	Utilize Concrete Header Curb in Lieu of Gravity Wall #12	4
17.0	Eliminate Guardrail on Eastbound Pair from Sta 217+57 to 218+50	3
18.0	Shift Vertical Alignment Closer to Existing on Eastbound Pair from Sta 212+50 to 220+50	w/ 17.0
19.0	Reduce Improvements to Holly Street	4
20.0	Limit Improvements West of SR 515 to Only Right Turn Taper from SR 53 to SR 515 South	4
21.0	Eliminate Sidewalks on Eastbound Pair from Split to Holly Street	4
22.0	Eliminate Signals at Holly Street and Bryant Street	4

TEAM STUDY AGENDA

VALUE ENGINEERING WORKSHOP AGENDA

**For
GEORGIA DEPARTMENT OF TRANSPORTATION**

**Project # STP00-0065-02(013) PI No. 621490-
SR 53 from SR 515 to CR 243/Industrial Blvd
Pickens County, Georgia**

28 HOUR – VE STUDY

9-12 May, 2016

The value engineering workshop for the subject project will be conducted for 3-1/2 days from 9-12 May 2016, **in the Engineering Services Conference Room (5CR1L2) on the 5th floor of the GDOT General Office Facility located at 600 W. Peachtree Street NW, Atlanta GA 30308; POC – Matt Sanders @ (404)631-1752 voice**

Pre-workshop Activities

The VE Team Leader coordinates logistics with GDOT, and confirms project objectives and any unique requests, and develops a cost model for the project. The VE Team receives and reviews all project documents.

MONDAY

0800 - 0900

VE Team Introduction Phase

Tom Orr, PE, CVS
VE Team Leader, MBP
(VE Team Only)

The VETL will review previous events along with activities planned for the week and outline several areas which may be investigated by the VE team.

The team members will discuss their initial impression and understanding of the project with other team members based on their pre-study review of the project plans, cost estimates, and available calculations. The VE Team Leader will provide cost models, and cost bar graphs to help the team identify the high-cost features of the project.

0900 - 1030

Project Design Briefing

VE Team; A/E, GDOT

The A/E project design manager will discuss the project constraints/requirements and the proposed design solution(s) in detail. The VE team members will ask questions as appropriate to completely understand the project requirements and the proposed design solution (both alternatives considered and those recommended by the design team).

MONDAY (CONTINUED)

1030 - 1200 **Function Analysis and Risks** VE Team

The VE team will discuss the required functions and inherent risks of the project. The project cost model will be analyzed to identify functions provided by all project features.

1200 - 1300 **Lunch**

1300 - 1600 **Creative Phase** VE Team

The VE team will creatively review, Brainstorm, and tabulate possible design alternatives for the project. While the designer's solution will serve as the "baseline", the team will identify alternatives not in the recommended solution, but deserving of further investigation. Each project feature will be carefully analyzed with the basic questions in mind:

- What is the system/item?***
- What does it do (what is its basic function)?***
- What must it do?***
- What does it cost?***
- What is the item worth?***
- What else will do the same, or a better job?***
- What does that alternative cost?***

During the creative phase, the team will not judge the ideas. The essential requirements for the project, however, must always be considered.

1600 - 1700 **Analysis Phase** VE Team

During this phase, all of the ideas or alternatives will be ranked according to their potential for life-cycle (25-year) cost reduction and the potential for acceptance by GDOT, Engineering Designers, and other appropriate parties.

TUESDAY

0800 - 1700 **Development Phase** VE Team

During the development phase, each team member will gather information and prepare written proposals for those ideas assigned to him/her. These may require additional discussions with the designer, GDOT representatives, outside contractors and suppliers, and other specialists to fully define the alternative. The team members will prepare sketches, perform calculations and develop other data to support each proposal. In addition, each team

VALUE ENGINEERING TEAM STUDY

member will prepare estimates of costs for each alternative as originally designed, and as proposed by the VE team.

WEDNESDAY

0800 - 1200 **Development Phase** VE Team

1200 - 1300 Lunch

1300 - 1700 **Development Phase & Quality Review** VE Team

THURSDAY

0800 – 0900 **Prepare for Presentation** VE Team

0900 – 1000 **VE Presentation** VE Team Members, Design Team & GDOT Reps

The Value Engineering Team will present the proposals developed in the course of the study to the design team representatives and any participating stakeholders. The intent of the presentation is to give a clear understanding of the basis of the proposals rather than to reach a conclusion as to their acceptability. A summary table of results will be distributed at the presentation. The formal VE Reports will be issued within 8 business days of the workshop conclusion.

1000 – 1200 **VE Team Wrap-up & Final QC/QA** VE Team Members only

The Value Engineering Team will have a wrap-up session consisting of a final review of proposals to ensure consistency and clarity of content.