

VALUE ENGINEERING STUDY

Project # CSSTP-0006-00(252) PI No. 0006252
Project # CSSTP-0006-00(253) PI No. 0006253

**S.R. 44 from US 441 to I-20
Putnam/Greene County, Georgia**

Prepared for:



One Georgia Center
600 West Peachtree NW
Atlanta, Georgia 30308

6 December 2012



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6 December 2012

Mr. Matt Sanders, AVS
Value Engineering Specialist
GDOT - Engineering Services
One Georgia Center - 5th Floor
600 W. Peachtree Street NW
Atlanta, GA 30308

Re: V.E. Workshop – S.R. 44 from US 441 to I-20, Putnam/Greene County, GA
Project #'s: CSSTP-0006-00(252) – PI#: 0006252; CSSTP-0006-00(253) – PI#: 0006253

Dear Mr. Sanders:

U.S. Cost, Inc. is pleased to submit two (2) hard copies and one (1) CD of the Value Engineering Study Report on the above referenced projects. We appreciate the assistance and participation of the GDOT management personnel as well as the design teams.

This Workshop resulted in the development of twenty-seven (27) 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, constructability and long-term performance of the project features.

Please feel free to contact me 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,

U.S. COST INCORPORATED



Tom Orr, P.E., CVS
V.E. Team Leader

CC: L. Myers, GDOT

VALUE ENGINEERING TEAM STUDY

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VALUE ENGINEERING STUDY

PROJECT DESCRIPTION

This workshop involved evaluating 2 projects which involve widening of S.R. 44 from US 441 in Putnam County to I-20 in Greene County. Both projects involve widening S.R. 44 from the existing two-lane road to a four-lane road with both rural and urban sections. Additional information on the 2 projects follows.

S.R. 44 from US 441 to Linger Longer Road, Putnam/Greene County

Project #CSSTP-0006-00(252)/PI #0006252, begins at a new intersection with US 441/SR 24 about 1.1 miles North of the intersection of US 441/SR 24 and Reids Road in Putnam County and ends at the intersection of S.R. 44 and Linger Longer Road in Greene County, a mainline distance of 11.2 miles. S.R. 44 within these limits is functionally classified as a Rural Minor Arterial and is designated as a Statewide Bicycle route. The design of the rural sections include a 32' depressed median with 2-12' wide lanes in each direction. The urban section design includes a 20' raised median with 2-11' wide lanes in each direction. The posted speed limit is 55 MPH for most of the corridor, except in the area of Reynolds Plantation resort where it varies from 35 to 45 MPH. For this widening project, new bridge structures are proposed at Lick Creek, Rooty Creek, Crooked Creek and Oconee River.

S.R. 44 from Linger Longer Road to I-20, Greene County

Project #CSSTP-0006-00(253)/PI #0006253, begins at the end of PI #0006252 just North of the intersection of S.R. 44 and Linger Longer Road and ends at I-20 in Greene County, a distance of 7.6 miles. S.R. 44 within these limits is functionally classified as a Rural Minor Arterial and is designated as a Statewide Bicycle route. The design of the rural sections include a 32' depressed median with 2-12' wide lanes in each direction. The urban section design includes a 20' raised median with 2-11' wide lanes in each direction. The posted speed limit is 55 MPH for most of the corridor. For this widening project, new bridge structures are proposed at Little Creek and Richland Creek, and bridge widening over I-20.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Introduction

U.S. Cost conducted the Value Engineering Team Study on S.R. 44 from US 441 to I-20 road widening projects. The V.E. study was conducted for three and ½ days, 3 - 6 December 2012, at the Georgia Department of Transportation 5th floor Conference Room in Atlanta, GA. The study team was furnished with November 2012 design documents for use in conducting the VE workshop. The following individuals were members of the V.E. team:

Name	Firm	Discipline
Tom Orr, P.E., CVS	U.S. Cost, Inc.	VE Team Leader (VETL)
Greg Grant, P.E.	RS&H	Bridge/Structures
Jerry Brooks, P.E.	Kimley-Horn	Roadway Engineer
Chris Haggard, P.E.	Wolverton	Roadway Engineer
Gary Newton, P.E.	Kimley-Horn	Construction

Value Engineering Study Process

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 V.E. team was first briefed on the project design by Georgia DOT management and design team representatives in a Design Presentation the morning of the first day of the V.E. 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.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

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
- FHWA Design Policies
- Other Environmental Restrictions (EA Requirements TBD)

Project Constraints

The primary project constraint involves historical parcels and structures along the corridor which must be avoided. Also, the existing corridor has Georgia Power transmission lines which are being avoided as much as possible in the design.

Function Analysis

As a basic part of the V.E. process, the team conducted a Function Analysis session on the S.R. 44 from US 441 to I-20 projects 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 “*Increase Capacity*”. A detailed project function analysis of the characteristics of the project and the project features is presented in the Appendix.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Risk Analysis

The group identified the following project risk elements, which may impact the S.R. 44 from US 441 to I-20 road widening projects. This exercise served as a catalyst for the Creative Phase of the study when several ideas were suggested which would mitigate these project risks.

Risk Elements/Concerns

- Impacts to Utilities
- Impacts to Businesses and Property Owners
- Construction Traffic
- Adverse Recreational Impacts
- Adverse Environmental Impacts
- Impacts to Lake
- Impacts to Historical Properties
- Impacts to Travelling Public
- Lake Access During Construction
- Impacts to Farmland
- Fish Habitat Affecting Bridge Construction

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Creative Phase

The Creative Phase of the V.E. study was initiated the afternoon of the first day of the study. A total of fifty (50) 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:

- Reducing width of required corridor
- Reducing impact to property owners
- Matching existing grades wherever possible
- Reusing existing pavement wherever possible
- Matching existing horizontal alignment wherever possible
- Reducing Right-of-way acquisition required

Additional ideas were generated reflecting alternative project components based on an understanding of local construction products and materials and the relative costs of installing them.

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 V.E. 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 V.E. ideas are as follows:

V.E. Idea Evaluation Criteria

Reduces Construction Time
Improves Constructability
Reduces Impacts
Improves Operations
Reduces Costs
Improves Service Life/Reduces Maintenance
Improves Phasing/Staging

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE session participants during an Analysis/Judgment Phase session at the end of the first study day. The intent of the meeting was to allow the participants an opportunity to discuss and evaluate the ideas. A few of the V.E. 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 Acceptability ranking was based on how each idea improves the value of the project when considered against the evaluation criteria listed previously. Those ideas, which the V.E. Team felt had the most promise were given a designation of 1-5 on acceptability. This is a time management tool to identify those proposals that have the greatest potential. Approximately twenty-seven (27) out of the original fifty (50) creative ideas were deemed promising for further investigation and analysis by the V.E. team.

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

ACCEPTABILITY OF IDEA

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

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Development Phase

The specific proposals found in the body of this report represent the positive results of investigations by the V.E. team on the S.R. 44 from US 441 to I-20 road widening projects. Each proposal represents a quality enhancing or cost saving alternative, which is documented by words, drawings and numbers. 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 representatives was conducted 6 December 2012 at 9 AM.

Basis of V.E. 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 (Jan. 9, 2012), 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 2012 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.

Several of these alternatives are either “mutually exclusive”/or have overlapping cost savings with other alternatives. These are indicated in the Proposal Summary Table. Items indicated as mutually exclusive indicates that acceptance of one alternative, precludes acceptance of the related proposal. Decision-makers are encouraged to evaluate these alternatives carefully in order to select the combination of alternatives that provides the greatest benefits to the project.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

The VE Team generated 50 creative ideas and developed 27 proposals for consideration by GDOT. Brief outlines of the VE proposals are as follows:

Proposal Highlights for PI #0006252:

B2-1 – Lower Profile of SR 44 over Rooty Creek by Approximately 3 feet. The current design has an excess freeboard of the Rooty Creek bridge equal to 3.49 ft. Bridge Proposal B2-1 proposes to lower the profile at this bridge by 3 feet. This alternative will save \$62,400 in construction costs and reduces the length of the bridge structure. The acceptance of this proposal is contingent on the acceptance of proposal R2-11 and the savings are also included in this proposal.

B2-2 – Lower Profile of SR 44 over Crooked Creek by Approximately 2.5 feet. The current design has an excess freeboard of the Crooked Creek bridge equal to 4.27 ft. Bridge Proposal B2-2 proposes to lower the profile at this bridge by 2.5 feet. This alternative will save \$52,000 in construction costs and reduces the length of the bridge structure. The acceptance of this proposal is contingent on the acceptance of proposal R2-16 and the savings are also included in this proposal.

B2-5 – Build Parallel Prestress Beam Bridge Without Connecting to Existing Bridge at SR 44 over Lick Creek. The current design widens the existing steel beam bridge at Lick Creek “in kind” with additional steel beams and a concrete deck. Bridge Proposal B2-5 proposes to build the widened portion of the bridge with prestressed beams and have an open joint in the median to separate the different structures. This alternative will save \$38,000 in construction costs and reduces maintenance of the bridge structure.

B2-6 – Eliminate the Overlay on the Existing Bridge for SR 44 Over Lick Creek. The current design builds a parallel bridge at Lick Creek and overlays the existing bridge deck to change the bridge to superelevated in one direction. Bridge Proposal B2-6 proposes to eliminate the overlay of the existing bridge deck and cut new scupper holes at the edge of the median and install a pipe director to channel the bridge drainage below the superstructure to drain the deck. This alternative will save \$80,739 in construction costs and reduces maintenance of the bridge components.

B2-7 – Build Parallel Prestressed Beam Bridge Instead of Widening “in kind” the Existing Steel Plate Girder Bridge at SR 44 over Oconee River. The current design widens the existing Oconee River bridge “in kind” with a steel plate girder beam bridge. Bridge Proposal B2-7 proposes to widen the bridge with prestressed beams and keep the existing bridge and widened portion independent by means of a 1” open joint. This alternative will save \$56,780 in construction costs and reduces maintenance of the bridge components.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0006252 (continued):

R2-1 - For Rural Sections Use 11' Lane Widths in lieu of 12'. In the current design the rural typical roadway section includes two 12' travel lanes in each direction. Proposal R2-1 reduces all travel lanes on the rural sections from 12' to 11'. This proposal eliminates impervious pavement area and results in a savings of \$784,168.

R2-1.1 - For Rural Sections Use 11' Wide Inside Lane and 12' Outside Lane. In the current design the rural typical roadway section includes two 12' travel lanes in each direction. As an alternative to Proposal R2-1, R2-1.1 reduces the inside travel lanes on the rural sections from 12' to 11' while maintaining the 12' width on the outside lanes. This proposal eliminates impervious pavement area and results in a savings of \$392,084.

R2-2 - For Urban Sections Use a 16' Wide Raised Median in lieu of a 20' Raised Median. In the current design the Urban Sections have a 20' raised median. Proposal R2-2 reduces the width of the raised median from 20 feet to 16 feet for the urban sections. This proposal reduces fill in the area of Lake Oconee, allows use of minimum right-of-way, and results in a savings of \$222,697.

R2-4 - For 2-Lane Side Street Sections Use 11' Lane Widths in lieu of 12'. In the current design, the vast majority of the 2-lane side street sections are shown as 12' travel lanes in each direction. Proposal R2-4 reduces all travel lanes on the side street sections from 12' to 11'. This proposal provides an acceptable design for side streets and results in a savings of \$64,914.

R2-5 - Eliminate 2' Paved Shoulder on 2-Lane Side Street Sections. In the current design, the 2-lane rural side street sections are shown with 2' paved shoulders. Proposal R2-5 eliminates the 2' paved shoulders on the rural side street sections. This proposal provides an acceptable GDOT design for side streets and results in a savings of \$138,756.

R2-7 – Reuse and Overlay Existing Pavement from Approximate Sta 332+00 to Approximate Sta 359+00 and from Approximate Sta 485+00 to Approximate Sta 734+00. In the current design, the pavement for SR44 is proposed to be replaced with full depth pavement construction for the entire project. Proposal R2-7 proposes to utilize the existing pavement in lieu of full depth pavement from approximate Sta 332+00 to approximate Sta 359+00 and from approximate Sta 485+00 to approximate Sta 734+00. This proposal improves construction staging, reduces new pavement construction efforts, and results in a savings of \$2,729,088.

R2-8 – Reduce Shoulder Width on Rural Side Streets from 10' to 8'. In the current design, the rural side street sections are shown with 10' total shoulder width. Proposal R2-8 reduces the total shoulder width on the rural side street sections from 10' to 8'. This proposal provides an acceptable GDOT design for side streets and results in a savings of \$1,454.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0006252 (continued):

R2-9 – Reduce Shoulder Width on Rural Side Streets from 10’ to 8’. In the current design, the urban side street sections are shown with 12’ total shoulder width. Proposal R2-9 reduces the total shoulder width on the urban side street sections from 12’ to 10’. This proposal provides an acceptable GDOT design for side streets and results in a savings of \$449.

R2-10 – Reduce the Required Right of Way Width from 200’ to 140’ and Use Permanent Easement Outside of Right of Way. The current design has a required right of way corridor of 200’ or more at various and multiple locations throughout the project limits. Proposal R2-10 reduces the required right of way corridor to a maximum of 140’ and uses permanent easement beyond the right of way. This proposal allows property owners the ability to use land for certain activities and results in a savings of \$394,000.

R2-11 – Revise the Vertical Profile from Sta 115+00 to Sta 234+00 to Reduce the Volume of Earthwork. The current vertical profile does not follow the existing terrain or the existing roadway elevations from Sta 115+00 to Sta 234+00 causing excessive cuts and fills in those areas. Proposal R2-11 develops a vertical profile from Sta 115+00 to Sta 234+00 that more closely follows the existing terrain or roadway. This proposal reduces earthwork and results in a savings of \$385,135.

R2-12 – Revise Horizontal Alignment from Approximate Sta 393+00 to Approximate Sta 490+00 to Closer Match Existing Alignment. The current horizontal alignment of SR44 is shifted to the West as it approaches the historical resource at Sta 418+00 and shifts to the East in order to minimize impacts to this resource. Proposal R2-12 shifts the horizontal alignment of SR44 to more closely follow the existing alignment and avoid the displacements on the West side of the road. This proposal reduces impacts to a historical property, reduces right-of-way costs and results in a savings of \$117,000.

R2-16 – Revise the Vertical Profile from Sta 297+00 to Sta 370+00 to Reduce the Volume of Earthwork. The current vertical profile does not follow the existing terrain or the existing roadway elevations causing excessive cuts and fills in those areas. Proposal R2-16 develops a vertical profile that more closely follows the existing terrain or roadway and still meets the desired speed design of 55 mph. The bridge over Crooked Creek is also lowered. This proposal reduces impacts to adjacent properties, reduces length of the Crooked Creek bridge and results in a savings of \$210,533.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0006253:

B3-4 – Maintain Existing Bridge Baseline for I-20 Bridge, Eliminate Overlay, and Widen Only to One Side. The current design widens the existing SR 44 bridge over I-20 symmetrically to avoid a minimum vertical clearance issue if all the widening occurs on one side. The design shifts the Profile Grade Line (PGL) from the existing PGL approximately 10-11 feet left and overlays the deck to obtain the desired cross slope. Bridge Proposal B3-4 proposes to widen the bridge on 1 side only and keep the PGL on the existing PGL. This alternative will save \$166,243 in construction costs and allows for single stage construction.

B3-4.1 – Maintain the Original Design Construction Centerline on the SR 44 Bridge over I-20, Widen the Bridge Symmetrically, but Reduce the Amount of Bridge Overlay by Warping the Center Raised Median. The current design widens the existing SR 44 bridge over I-20 symmetrically to avoid a minimum vertical clearance issue if all the widening occurs on one side. The design shifts the Profile Grade Line (PGL) from the existing PGL approximately 10-11 feet left and overlays the deck to obtain the desired cross slope. As an alternative to B-3-4, Bridge Proposal B3-4.1 proposes to maintain the Original Design plan layout and PGL location. However, it reduces the extent of overlay to the portions of deck to the right of the raised median. This alternative will save \$224,180 in construction costs and simplifies construction.

R3-1 - For Rural Sections Use 11' Lane Widths in lieu of 12'. In the current design the rural typical roadway section includes two 12' travel lanes in each direction. Proposal R3-1 reduces all travel lanes on the rural sections from 12' to 11'. This proposal eliminates impervious pavement area and results in a savings of \$763,434.

R3-1.1 - For Rural Sections Use 11' Wide Inside Lane and 12' Outside Lane. In the current design the rural typical roadway section includes two 12' travel lanes in each direction. As an alternative to Proposal R3-1, R3-1.1 reduces the inside travel lanes on the rural sections from 12' to 11' while maintaining the 12' width on the outside lanes. This proposal eliminates impervious pavement area and results in a savings of \$381,717.

R3-2 - For Urban Sections Use a 16' Wide Raised Median in lieu of a 20' Raised Median. In the current design the Urban Sections have a 20' raised median. Proposal R3-2 reduces the width of the raised median from 20 feet to 16 feet for the urban sections. This proposal reduces allows use of minimum right-of-way, and results in a savings of \$33,072.

R3-4 - For 2-Lane Side Street Sections Use 11' Maximum Lane Widths in lieu of 12' Maximum. In the current design, the side street sections are shown as 12' maximum width travel lanes in each direction. Proposal R3-4 reduces all travel lanes on the side street sections from 12' to 11' maximum. This proposal provides an acceptable design for side streets and results in a savings of \$7,571.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0006253 (continued):

R3-5 - Eliminate Paved Shoulder on Side Streets. In the current design, the rural side street sections are shown with paved shoulders. Proposal R3-5 eliminates the paved shoulders on the rural side street sections. This proposal provides an acceptable GDOT design for side streets and results in a savings of \$11,149.

R3-7 – Reuse and Overlay Existing Pavement from Sta 900+00 to Sta 966+00, from Sta 974+00 to Sta 982+00, from Sta 1155+00 to Sta 1183+00, and from Sta 1186+00 to Sta 1191+00. In the current design, the pavement for SR44 is proposed to be replaced with full depth pavement construction for the entire project. Proposal R3-7 proposes to utilize the existing pavement in lieu of full depth pavement from Sta 900+00 to Sta 966+00, from Sta 974+00 to Sta 982+00, from Sta 1155+00 to Sta 1183+00, and from Sta 1186+00 to Sta 1191+00. This proposal improves construction staging, reduces new pavement construction efforts, and results in a savings of \$860,160.

R3-8 – Revise SR44 Horizontal Alignment from Approximate Sta 1075+00 to Approximate Sta 1145+00 to Closer Match Existing Alignment. The current horizontal alignment of SR44 is shifted away from the existing alignment between approximate Sta 1075+00 to approximate Sta 1145+00. Proposal R3-8 shifts the horizontal alignment of SR44 to more closely follow the existing curved alignment. This proposal avoids impact to the lake located at Sta 1093+00, avoids taking the house on Parcel 34, and results in a savings of \$1,125,480.

R3-9 – Revise Horizontal Alignment from Approximate Sta 830+00 to Approximate Sta 845+00 to Closer Match Existing Alignment. The current horizontal alignment of SR44 is shifted to the East as it approaches the intersection with Lake County Drive, and the alignment and associated fill create the need for a structure displacement on Parcel 55. Proposal R3-9 shifts the horizontal alignment of SR44 to more closely follow the existing alignment and avoids the displacement of Parcel 55. This proposal reduces avoids the structure displacement on Parcel 55, reduces right-of-way costs and results in a savings of \$250,000.

SUMMARY OF VALUE ENGINEERING PROPOSALS

Project # CSSTP-0006-00(252) PI No. 0006252
SR 44 from US 441 to LINGER LONGER ROAD
GREENE/PUTNAM COUNTY, GEORGIA

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	Note: Brackets mean additional cost		
	BRIDGES/STRUCTURES (B)		
B2-1	Lower Profile of SR 44 over Rooty Creek by Approximately 3 feet	Savings incl. in R2-11	Contingent on acceptance of R2-11
B2-2	Lower Profile of SR 44 over Crooked Creek by Approximately 2.5 feet	Savings incl. in R2-16	Contingent on acceptance of R2-16
B2-5	At Lick Creek, Build Parallel Prestressed Beam Bridge Without Connecting to Existing Bridge	38,000	
B2-6	Eliminate the Overlay on the Existing Bridge for SR 44 Over Lick Creek.	80,739	
B2-7	Build Parallel Prestressed Beam Bridge Instead of Widening “in kind” the Existing Steel Plate Girder Bridge at SR 44 over Oconee River	56,780	
	ROADWAY (R)		
R2-1	For Rural Sections Use 11’ Lane Widths in lieu of 12’	784,168	Mutually exclusive w/ R2-1.1
R2-1.1	For Rural Sections Use 11’ Wide Inside Lane and 12’ Outside Lane	392,084	Mutually exclusive w/ R2-1
R2-2	For Urban Sections Use 16’ Raised Median Width in lieu of 20’	222,697	
R2-4	For 2-lane Side Street Sections Use 11’ Wide Lanes in lieu of 12’	64,914	
R2-5	Eliminate 2’ Paved Shoulder on 2-lane Side Streets	138,756	
R2-7	Reuse and Overlay Existing Pavement from Approximate Sta 332+00 to Approximate Sta 359+00 and from Approximate Sta 485+00 to Approximate Sta 734+00	2,729,088	
R2-8	Reduce Shoulder Width on Rural Side Streets from 10’ to 8’	1,454	

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0006-00(252) PI No. 0006252
SR 44 from US 441 to LINGER LONGER ROAD
GREENE/PUTNAM COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	ROADWAY (R) - continued		
R2-9	Reduce Shoulder Width on Urban Side Streets from 12' to 10'	449	
R2-10	Reduce Right-of-Way from 200' to 140' and Use Remaining as Permanent Easement at Multiple Locations	394,000	
R2-11	Revise the Vertical Profile from Sta 115+00 to Sta 234+00 to Reduce the Volume of Earthwork	385,135	
R2-12	Revise Horizontal Alignment from Approximate Sta 393+00 to Approximate Sta 490+00 to Closer Match Existing Alignment	117,000	
R2-16	Revise the Vertical Profile from Sta 297+00 to Sta 370+00 to Reduce the Volume of Earthwork	210,533	

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0006-00(253) PI No. 0006253
SR 44 from LINGER LONGER ROAD to I-20
GREENE COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	Note: Brackets mean additional cost		
	BRIDGES/STRUCTURES (B)		
B3-4	On I-20 Bridge Maintain Existing Bridge Baseline, Eliminate Overlay and Widen to Only One Side	166,243	Mutually exclusive with B3-4.1
B3-4.1	Maintain the Original Design Construction Centerline on the SR 44 bridge over I-20, Widen the Bridge Symmetrically, but Reduce the Bridge Overlay by Warping the Center Raised Median.	224,180	Mutually exclusive with B3-4
	ROADWAY (R)		
R3-1	For Rural Sections Use 11' Lane Widths in lieu of 12'	763,434	Mutually exclusive w/ R3-1.1
R3-1.1	For Rural Sections Use 11' Inside Lane and 12' Outside Lane	381,717	Mutually exclusive w/ R3-1
R3-2	For Urban Sections Use 16' Median Width in lieu of 20'	33,072	
R3-4	For 2-lane Side Street Sections Use 11' Maximum Width Lanes in lieu of 12' Maximum	7,571	
R3-5	Eliminate Paved Shoulder on Side Streets	11,149	
R3-7	Reuse and Overlay Existing Pavement from Sta 900+00 to 966+00, Sta 974+00 to 982+00, Sta 1155+00 to 1183+00, and Sta 1186+00 to 1191+00	860,160	
R3-8	Revise Horizontal Alignment from Sta 1075+00 to Sta 1145+00 Closer to Existing	1,125,480	
R3-9	Revise Horizontal Alignment from Sta 830+00 to Sta 845+00 to Closer Match Existing Alignment	250,000	

VALUE ENGINEERING PROPOSAL

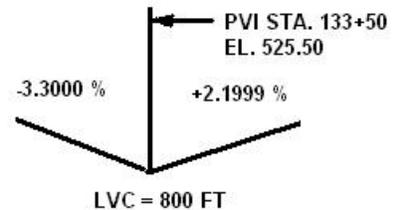
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION: LOWER PROFILE OF SR 44 OVER ROOTY CREEK BY APPROXIMATELY 3 FEET.

ORIGINAL DESIGN:

The Original Design uses the following Design Profile:
Using the freeboard requirements of 50 year storm +2 ft and 100 year storm +1 ft as the minimum elevation of the bottom of beam, this profile has an excess freeboard equal to 3.49 ft.



PROPOSED CHANGE:

It is proposed to lower the profile of the road by 3 feet to minimize the freeboard. At a 3 feet reduction in profile, the bridge length will be reduced by 2 x 3 feet x 2 sides of the bridge = 12 feet.

JUSTIFICATION:

The Original Design of bridge is based on several geometric controls. These include the following: minimum setbacks from the stream (10 ft), minimum hydraulic opening by bridge hydraulic analysis, superstructure depth and 2:1 end slopes that all work to tie in with a given roadway design profile. Care must be exercised to maintain the low point of the profile off of the bridge deck surface. With this reduction in bridge length it is feasible to reduce the depth of the beam and perhaps achieve additional savings. However, as the cost estimate is based on square foot cost, determining these savings is not quickly achieved and out of scope of the VE Study.

ADVANTAGES:

- Reduced construction cost
- Reduced Maintenance based on less structure to maintain

DISADVANTAGES:

- Geometric challenges in achieving the roadway geometry necessary to realize these savings

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 468,000		\$ 468,000
PROPOSED CHANGE:	\$ 405,600		\$ 405,600
SAVINGS:	\$ 62,400		\$ 62,400

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B2-1	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @90 x 40	1	SF	7,065	\$66.24	\$468,000
SUBTOTAL – COST TO PRIME					\$468,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$468,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @78 x 40	1	SF	6,123	\$66.24	\$405,600
SUBTOTAL – COST TO PRIME					\$405,600
MARKUP					Incl.
TOTAL CONTRACT COST					\$405,600

Difference [Original-Proposed] **\$62,400**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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) |
|---|--|

CALCULATIONS

PROPOSAL NUMBER: B2-1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Calculate Excess Freeboard - Rooty Creek

Lowest PGL at a bent =				530.95	estimated (Bent 1)	
					(Grades on bridge prelim are incorrect)	
Cross slope			-0.64 ft		32 ft @	0.02 ft/ft
Beam Depth			-4.5 ft	54" Bulb Tee		
Slab & coping			-1 ft	allowance		
Bottom of beam			524.81 ft			
50 year	519.32	el + 2 ft =	521.32			
100 year	519.65	el + 1 ft =	520.65			
Controlling elev			521.32			
Could lower the grade by			3.49 ft max			
		Say	3 ft			

CALCULATIONS

PROPOSAL NUMBER: B2-1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

From the Cost Estimate

Line	Item	Unit	Description	Quantity	Price	Amount
0617	543-9000	LS	CONSTR OF BRIDGE COMPLETE - #1 OVER ROOTY CREEK 2 @ 90 X 40	1	\$468,000.00	\$468,000.00

[ORIGINAL DESIGN]

Proposed bridge width added	39.250 ft
Length of Bridge	90.000 ft
Number of bridges	2
Area of bridge(s)	7065.0 ft2

Average cost per ft2

$$\frac{\$ 468,000.00}{7065.0} = \$ 66.24 \text{ /ft2}$$

Amount of length reduction = 2 x 3 ft x 2 sides = 12 ft

[PROPOSED CHANGE]

Proposed bridge width added	39.250 ft
Length of Bridge	78.000 ft
Number of bridges	2
Area of bridge(s)	6123.0 ft2

Reduction in area =

$$7065.0 \text{ ft2 [Original Design]} - 6123.0 \text{ ft2 [Proposed Change]} = 942.0 \text{ ft2}$$

Cost of Proposed Change	6123.0 ft2
	\$ 66.24 /ft2
	\$ 405,600.00

Difference: \$ 62,400.00 Savings

VALUE ENGINEERING PROPOSAL

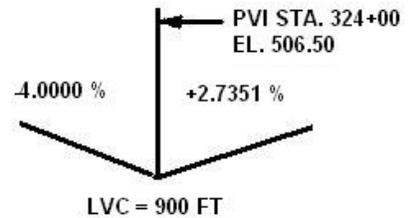
PROPOSAL NUMBER: B2-2	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION: LOWER PROFILE OF SR 44 OVER CROOKED CREEK BY APPROXIMATELY 2.5 FEET.

ORIGINAL DESIGN:

The Original Design uses the following Design Profile:
Using the freeboard requirements of 50 year storm +2 ft and 100 year storm +1 ft as the minimum elevation of the bottom of beam, this profile has an excess freeboard equal to 4.27 ft.



PROPOSED CHANGE:

It is proposed to lower the profile of the road by 2.5 feet to minimize the freeboard. At a 2.5 feet reduction in profile, the bridge length will be reduced by 2 x 2.5 feet x 2 sides of the bridge = 10 feet. (Note: cost savings are included in Proposal R2-16).

JUSTIFICATION:

The Original Design of bridge is based on several geometric controls. These include the following: minimum setbacks from the stream (10 ft), minimum hydraulic opening by bridge hydraulic analysis, superstructure depth and 2:1 end slopes that all work to tie in with a given roadway design profile. Care must be exercised to maintain the low point of the profile off of the bridge deck surface. With this reduction in bridge length it is feasible to reduce the depth of the beam and perhaps achieve additional savings. However, as the cost estimate is based on square foot cost, determining these savings is not quickly achieved and out of scope of the VE Study.

ADVANTAGES:

- Reduced construction cost
- Reduced Maintenance based on less structure to maintain

DISADVANTAGES:

- Geometric challenges in achieving the roadway geometry necessary to realize these savings

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 624,000		\$ 624,000
PROPOSED CHANGE:	\$ 572,000		\$ 572,000
SAVINGS:	\$ 52,000		\$ 52,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B2-2	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #2 over Rooty Creek 2 @120 x 40	1	SF	9,420	\$66.24	\$624,000
SUBTOTAL – COST TO PRIME					\$624,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$624,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #2 over Rooty Creek 2 @110 x 40	1	SF	8,635	\$66.24	\$572,000
SUBTOTAL – COST TO PRIME					\$572,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$572,000

Difference [Original-Proposed] **\$52,000**

SOURCES

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

CALCULATIONS

PROPOSAL NUMBER: B2-2

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Calculate Excess Freeboard - Crooked Creek

Lowest PGL at a bent =	513.87	estimated (Bent 1)	
		(Grades on bridge prelim are incorrect)	
Cross slope	-0.64 ft	32 ft @	0.02 ft/ft
Beam Depth	-5.25 ft	63" Bulb Tee	
Slab & coping	-1 ft	allowance	
Bottom of beam	506.98 ft		
50 year	519.32 el + 2 ft =	502.24	
100 year	519.65 el + 1 ft =	502.71	
Controlling elev	502.71		
Could lower the grade by	4.27 ft max		
	Say	2.5 ft	running with previous estimate

CALCULATIONS

PROPOSAL NUMBER: B2-2

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

From the Cost Estimate

Line	Item	Unit	Description	Quantity	Price	Amount
0618	543-9000	LS	CONSTR OF BRIDGE COMPLETE - #2 OVER CROOKED CREEK 2 @ 120 X 40	1	\$624,000.00	\$624,000.00

[ORIGINAL DESIGN]

Proposed bridge width added	39.250 ft
Length of Bridge	120.000 ft
Number of bridges	2
Area of bridge(s)	9420.0 ft2

Average cost per ft2

$$\frac{\$ 624,000.00}{9420.0} = \$ 66.24 /ft2$$

Amount of length reduction = 2 x 2.5 ft x 2 sides = 10 ft

[PROPOSED CHANGE]

Proposed bridge width added	39.250 ft
Length of Bridge	110.000 ft
Number of bridges	2
Area of bridge(s)	8635.0 ft2

Reduction in area =

$$9420.0 \text{ ft2 [Original Design]} - 8635.0 \text{ ft2 [Proposed Change]} = 785.0 \text{ ft2}$$

Cost of Proposed Change	8635.0 ft2
	\$ 66.24 /ft2
	\$ 572,000.00

Difference: \$ 52,000.00 Savings

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	B2-5	PAGE NUMBER:	1 of 7
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION:	BUILD PARALLEL PRESTRESS BEAM BRIDGE WITHOUT CONNECTING TO EXISTING BRIDGE AT SR 44 OVER LICK CREEK.
------------------------------	--

ORIGINAL DESIGN: The existing bridge over Lick Creek is a steel beam bridge. The original design widens the existing bridge “in kind” with additional steel beams and a concrete deck.

PROPOSED CHANGE: It is proposed to build the widened portion of the bridge with prestressed beams and have an open joint in the median to separate the different structures.

JUSTIFICATION: At present, prestressed beam bridges are less expensive than steel beam bridges. There is enough freeboard to allow for the additional depth of the PSC beams. If this was a new structure, steel beams would not be considered. The open joint isolates the structures with differing deflections from each other, thereby eliminating any conflict. As the steel portion reaches its useful life that portion can be replaced with a more cost effective superstructure.

ADVANTAGES:

- Reduced construction cost
- Reduced maintenance

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 612,000		\$ 612,000
PROPOSED CHANGE:	\$ 574,300		\$ 574,300
SAVINGS:	\$ 38,000		\$ 38,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B2-5	PAGE NUMBER:	2 of 7
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Widen SR 44 over Lick Creek with Steel Beams	1	SF	8,670	\$70.59	\$612,000
SUBTOTAL – COST TO PRIME					\$612,000
MARKUP					--
TOTAL CONTRACT COST					\$612,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Widen SR 44 over Lick Creek with PSC Beams	1	SF	8,670	\$66.24	\$574,300
SUBTOTAL – COST TO PRIME					\$574,300
MARKUP					--
TOTAL CONTRACT COST					\$574,300

Difference [Original-Proposed] **\$38,000**

SOURCES

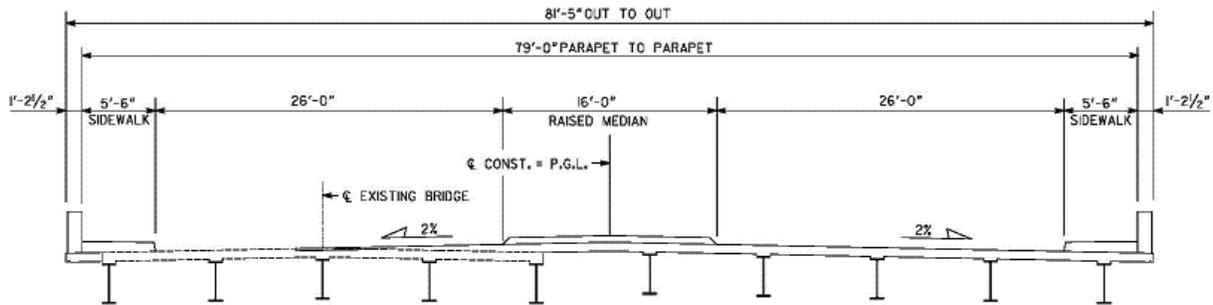
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B2-5

PAGE NUMBER: 3 of 7

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

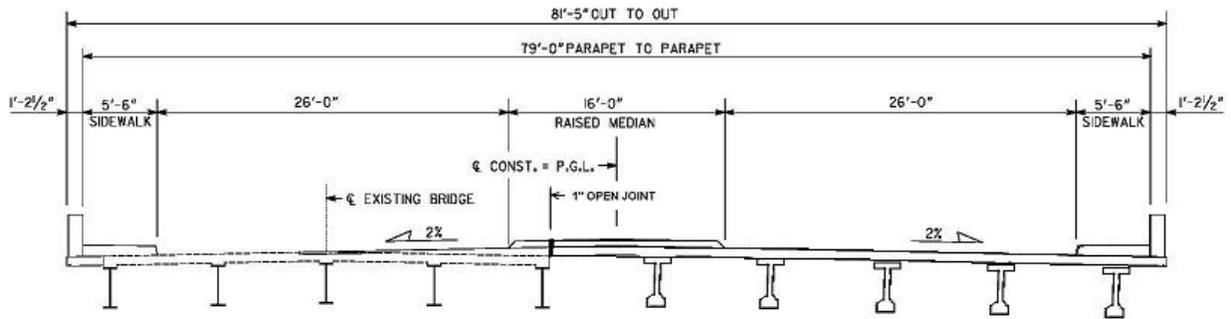


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B2-5

PAGE NUMBER: 4 of 7

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253



CALCULATIONS

PROPOSAL NUMBER: B2-5

PAGE NUMBER: 5 of 7

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

From cost estimate:

Lick Creek Widening = \$612,000

Length = 180

Width = (81'-5" out to out width minus 33'-3" of bridge deck to remain)

Area = Length x width = 180 x 48.17 = 8,670 ft²

\$/sq ft = 612,000/8,670 = \$70.59 ← Use for steel beam replacement

It is generally accepted that the \$/sq ft of PSC beam bridges are less than steel bridges.

Look at \$ per sq ft for Rooty Creek which are two new PSC beam bridges

Length = 90

Width = 39.25

Number of Bridges = 2

Cost = \$468,000

\$/sq ft = 468,000/(90x 39.25 x2) = \$66.24 ← Use for new PSC Beam Bridge Construction

Assume neither of these numbers accounts for the overlay and barrier removal on the new bridge.

Difference in cost = 70.59-66.24 = \$4.35 which seems very low

CALCULATIONS

PROPOSAL NUMBER: B2-5

PAGE NUMBER: 6 of 7

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Calculate Excess Freeboard - Lick Creek

Calculate Excess Freeboard - Lick Creek					
Lowest PGL at a bent =		448.36	estimated (Bent 1)		
(Grades on bridge prelim are incorrect)					
Cross slope		-0.64 ft	32 ft @	0.02	ft/ft
Beam Depth		-4.5 ft	54" Bulb Tee		
Slab & coping		-1 ft	allowance		
Bottom of beam		442.22 ft			
50 year	435.61	el + 2 ft =	437.61		
100 year	435.61	el + 1 ft =	436.61		
Controlling elev		437.61			
Excess freeboard		4.61 ft max			

CALCULATIONS

PROPOSAL NUMBER: B2-5

PAGE NUMBER: 7 of 7

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

The chart below is from the GDOT Bridge Design Manual

54" Bulb Tee works at 9 ft max for 90 ft span

54" Bulb Tee Beam

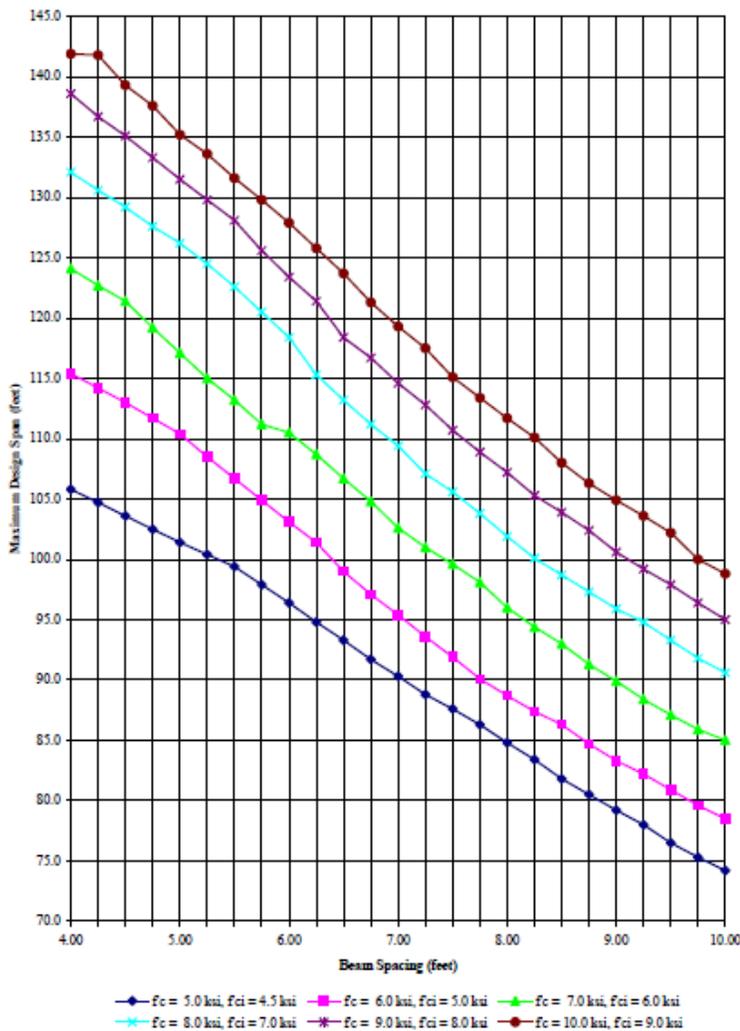


Figure 3-8

All strands are .6" diameter low relaxation strands. The 4 top flange strands are stressed to 10,000 pounds each and all remaining strands are stressed to 43,943 pounds each.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B2-6	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION:	ELIMINATE THE OVERLAY ON THE EXISTING BRIDGE FOR SR 44 OVER LICK CREEK.
------------------------------	--

ORIGINAL DESIGN: The existing bridge over Lick Creek is crowned in the middle. The current project design builds a parallel bridge and overlays the existing bridge deck to change the bridge to superelevated in one direction.

PROPOSED CHANGE: It is proposed to eliminate the overlay of the existing bridge deck. Also, cut new scupper holes at the edge of the median and install a pipe director to channel the bridge drainage below the superstructure (if necessary) to drain the deck. Otherwise, allow the water to drain off the deck and catch it in a drainage structure at the bridge end.

JUSTIFICATION: Traffic on the west bound bridge (existing bridge) doesn't require a constant cross slope. The crowned bridge can remain. The concern is the drainage to the median. With the barrier being replaced with a raised median, the existing scupper holes will be covered up. This alternative would provide the ability to drain the deck in approximately the same place and direct it away from splashing on the superstructure (if required by design).

ADVANTAGES:

- Reduced construction cost
- Reduced maintenance

DISADVANTAGES:

- Overhead installation of director device

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 90,739		\$ 90,739
PROPOSED CHANGE:	\$ 10,000		\$ 10,000
SAVINGS:	\$ 80,739		\$ 80,739

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B2-6	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
519-0400 Concrete Overlay, Portland Cement, Variable Thickness	3	SY	340	\$266.88	\$ 90,739
SUBTOTAL – COST TO PRIME					\$ 90,739
MARKUP					Incl.
TOTAL CONTRACT COST					\$ 90,739

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Deck Drainage – Drill new scupper holes and add drainage director pipes as needed (Allowance)	7 Allowance	LS	1	\$10,000	\$10,000
SUBTOTAL – COST TO PRIME					\$10,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$10,000

Difference [Original-Proposed] **\$80,739**

SOURCES

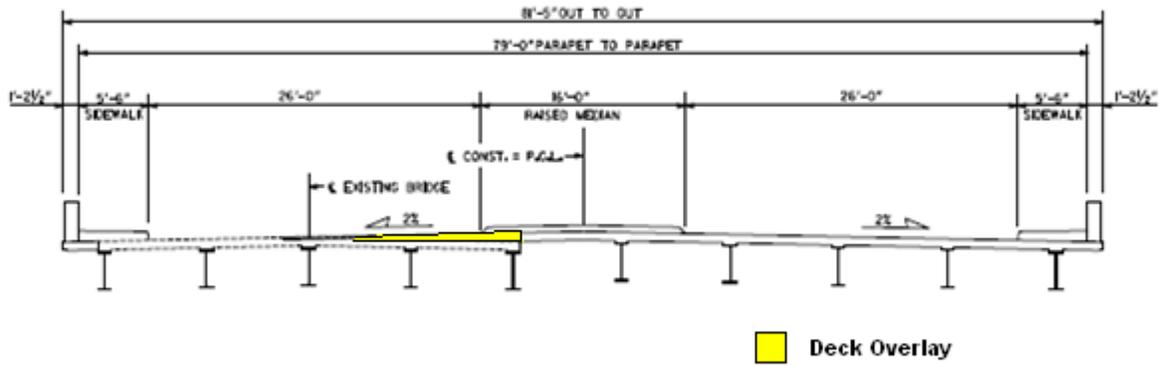
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B2-6

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

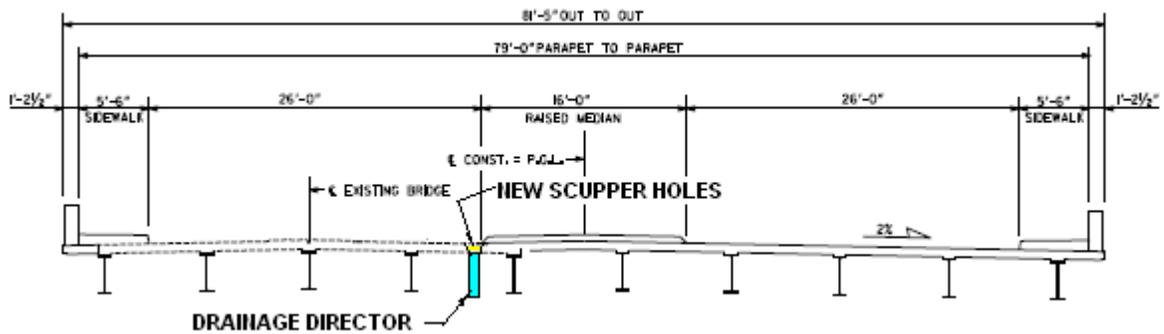


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B2-6

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252



CALCULATIONS

PROPOSAL NUMBER: B2-6

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Width of west-bound bridge to overlay:

- Approximately 17 feet wide (33.25 ft bridge to remain/2)
- Bridge is 180 feet long

$$\text{Area} = 17 \text{ ft} \times 180 \text{ ft} / 9 \text{ sf/sy} = 340 \text{ sy}$$

$$\text{Cost for overlay} = \$266.88 / \text{sy}$$

[GDOT Item no. 519-0400 Concrete Overlay, Portland Cement, Variable Thickness]

$$\text{Cost} = 340 \times 266.88 = \$90,739.20$$

Allowance for cutting scupper holes and installing drainage directors (PVC Pipe)

Say \$10,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B2-7

PAGE NUMBER: 1 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: BUILD PARALLEL PRESTRESSED BEAM BRIDGE INSTEAD OF WIDENING “IN KIND” THE EXISTING STEEL PLATE GIRDER BRIDGE AT SR 44 OVER OCONEE RIVER.

ORIGINAL DESIGN: The Original Design widens the existing bridge “in kind” with a steel plate girder beam bridge.

PROPOSED CHANGE: It is proposed to widen the bridge with prestressed beams and keep the existing bridge and widened portion independent by means of a 1” open joint. Maintain the pier placement on the widened portion.

JUSTIFICATION: Prestressed beam bridges are traditionally less expensive than steel beam bridges.

ADVANTAGES:

- Reduced construction cost
- Reduced maintenance

DISADVANTAGES:

- Difficult transportation of beam

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,543,600		\$ 1,543,600
PROPOSED CHANGE:	\$ 1,486,820		\$ 1,486,820
SAVINGS:	\$ 56,780		\$ 56,780

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B2-7	PAGE NUMBER:	2 of 6
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Construction of Bridge Complete	1	SF	21,865	\$70.60	\$1,543,600
SUBTOTAL – COST TO PRIME					\$1,543,600
MARKUP					Incl.
TOTAL CONTRACT COST					\$1,543,600

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Construction of Bridge Complete	7	SF	21,865	\$68	\$1,486,820
SUBTOTAL – COST TO PRIME					\$1,486,820
MARKUP					Incl.
TOTAL CONTRACT COST					\$1,486,820

Difference [Original-Proposed] **\$56,780**

SOURCES

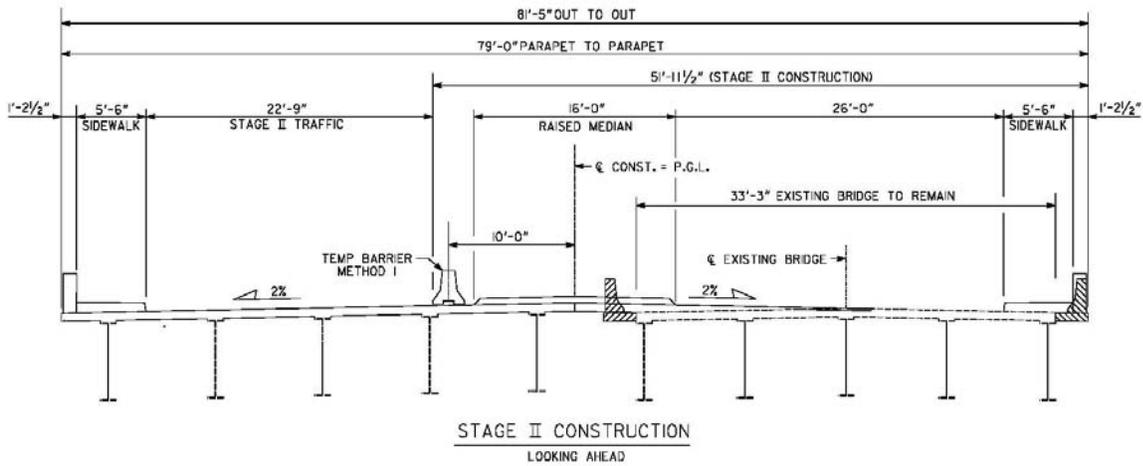
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Estimated by comparison to other bridges on the project) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B2-7

PAGE NUMBER: 3 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

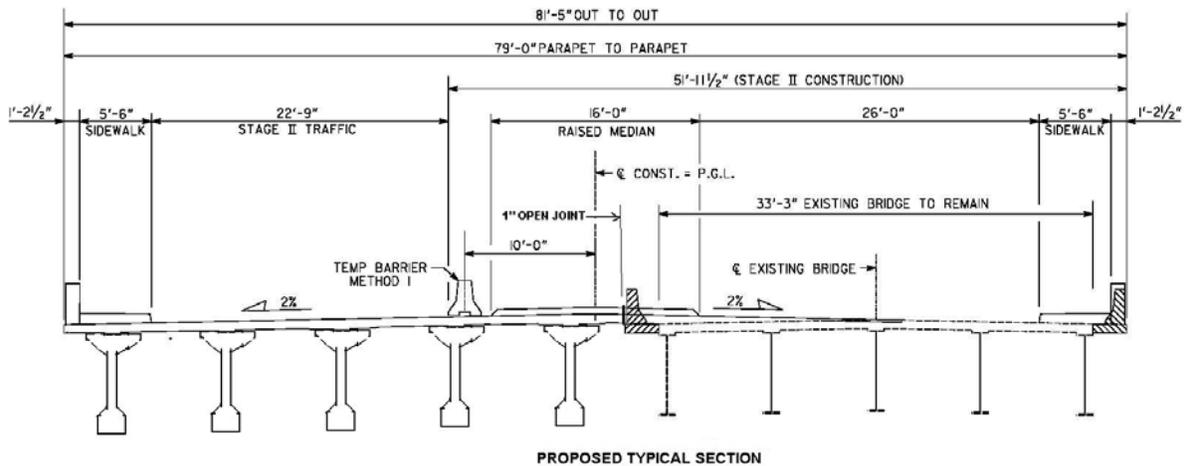


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B2-7

PAGE NUMBER: 4 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252



The sketch above shows the prestressed beam bridge adjacent to the existing steel bridge. Number and size of beams are shown for illustrative purposes only.

For Span 1 & 3, the length of beam required would be approximately 135 ft for the 137 ft span.

In the beam table for a 74 in Bulb Tee (following page), this beam will span the distance at a max beam spacing of 9 feet.

For span 2, the length of span is 180 feet, requiring a beam approximately 179 feet long.

We understand from Richard Potts (Standard Concrete Products) that they have designed a 180 ft long beam (84" deep) for a GDOT project in Gwinnett County (SR 316 over Colonial Pipeline).

CALCULATIONS

PROPOSAL NUMBER: B2-7

PAGE NUMBER: 5 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

74" Bulb Tee Beam

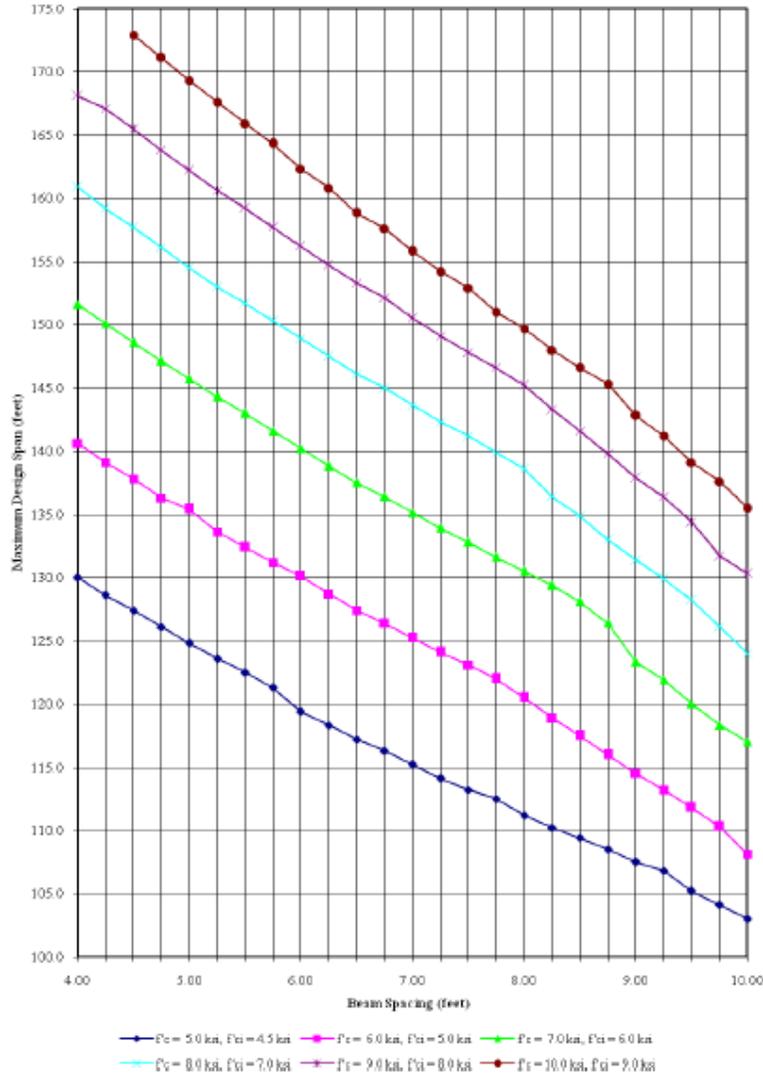


Figure 3-11

All strands are .5" diameter low relaxation strands. The 4 top flange strands are stressed to 10,000 pounds each and all remaining strands are stressed to 43,943 pounds each.

3-115

Version 10.26.10

3-115

CALCULATIONS

PROPOSAL NUMBER: B2-7

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Original Design:

Cost from Estimate = \$ 1,543,600

Width to build = 81.41 (out to out) – 33.25 ft to remain = 48.16 ft

Length = 454 ft

Area = 21,865 SF

\$/SF = \$ 1,543,600 / 21,865 SF = \$ 70.60/SF

Say build the PSC Beam widening for \$ 68/SF (approximately the price of the other PSC Beam bridges on the project)

\$68/SF x 21,865 SF = \$ 1,486,820

Savings = \$ 1,543,600 - \$ 1,486,820 = \$ 56,780

Is there excess freeboard available to allow for deeper beam?

PGL @ Bent 2 = 957.75

SE 79 ft/2 x .02 = - 0.79

Beam & Slab = - 1.00

84" beam = - 7.00

Bottom of beam = 948.96

50 year storm + 2 ft = 435 ft + 2 ft = 437 ft (OK)

100 year storm + 1 ft = 435 ft + 1 ft = 436 ft (OK)

There is enough freeboard for the deeper beam.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-1

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: FOR RURAL SECTIONS USE 11' LANE WIDTHS IN LIEU OF 12'.

ORIGINAL DESIGN: The current design of the rural typical roadway section includes two 12' travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on the rural sections from 12' to 11'.

JUSTIFICATION: The roadway is classified as "Rural Minor Arterial" and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 784,168		\$ 784,168
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 784,168		\$ 784,168

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-1	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	156672	\$4.65	\$728,525
Rooty Creek Bridge (reduction)	1	SF	360	\$66.24	23,847
Crooked Creek Bridge (reduction)	1	SF	480	\$66.24	31,796
SUBTOTAL – COST TO PRIME					\$784,168
MARKUP					Incl.
TOTAL CONTRACT COST					\$784,168

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$784,168**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

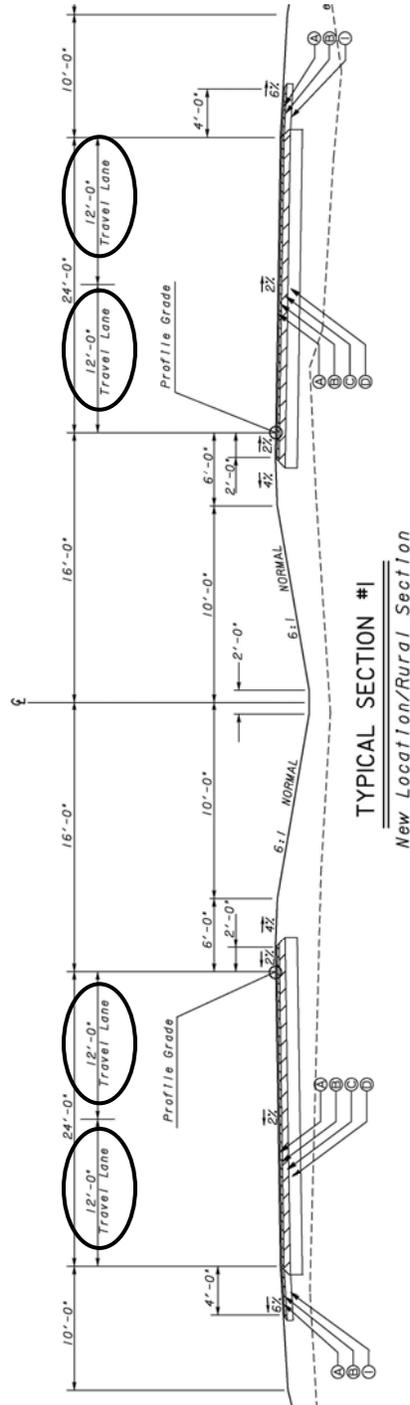
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

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



CALCULATIONS

PROPOSAL NUMBER: R2-1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF

440# Asph 19 MM = \$1.35/SF

550# Asph 25MM = \$1.70/SF

12" GAB (Ton) = \$1.05/SF

Tack Coat = \$0.02/SF

Total \$4.65/SF = \$41.85/SY

Pavement Area Calcs.

Rural Section length = 62303 LF total project – 23135 LF urban section = 39168 LF

39168 LF x 1' width reduction/lane x 4 lanes = 156,672 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R2-1.1	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION: FOR RURAL SECTIONS USE 11' WIDE INSIDE LANE AND 12' OUTSIDE LANE.

ORIGINAL DESIGN: The current design of the rural typical roadway section includes two 12' travel lanes in each direction.

PROPOSED CHANGE: As an alternative to proposal R2-1, it is proposed to reduce the inside travel lanes on the rural sections from 12' to 11' while maintaining the 12' width on the outside lanes.

JUSTIFICATION: The roadway is classified as "Rural Minor Arterial" and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual. The 12' outside lanes would allow for easier vehicle movements at turn locations.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 392,084		\$ 392,084
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 392,084		\$ 392,084

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-1.1	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	78336	\$4.65	\$364,262
Rooty Creek Bridge (reduction)	1	SF	180	\$66.24	11,924
Crooked Creek Bridge (reduction)	1	SF	240	\$66.24	15,898
SUBTOTAL – COST TO PRIME					\$392,084
MARKUP					Incl.
TOTAL CONTRACT COST					\$392,084

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$392,084**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

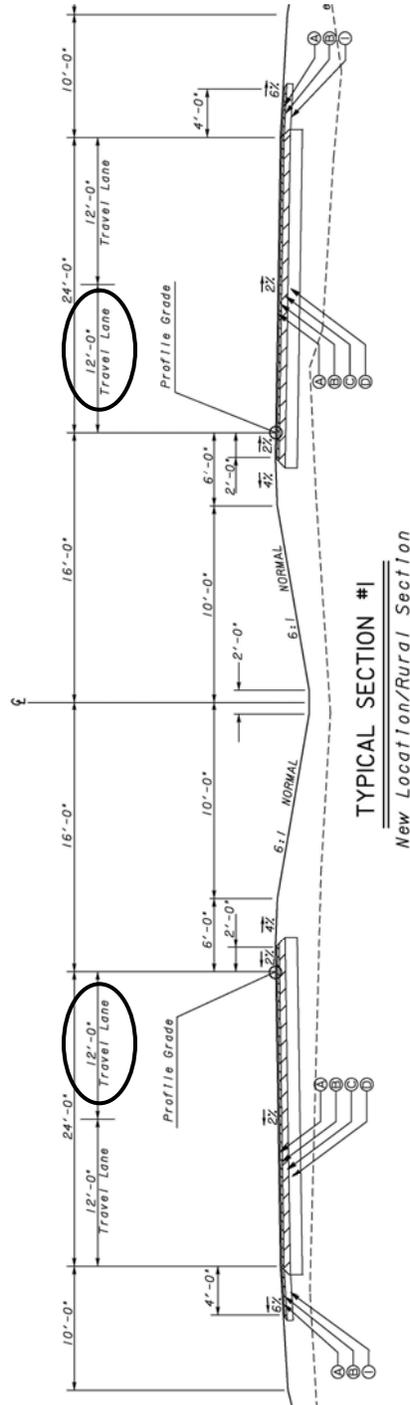
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-1.1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Proposed Change: Reduce inside travel lanes from 12'0" to 11'0"



CALCULATIONS

PROPOSAL NUMBER: R2-1.1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF

440# Asph 19 MM = \$1.35/SF

550# Asph 25MM = \$1.70/SF

12" GAB (Ton) = \$1.05/SF

Tack Coat = \$0.02/SF

Total \$4.65/SF = \$41.85/SY

Pavement Area Calcs.

Rural Section length = 62303 LF total project – 23135 LF urban section = 39168 LF

39168 LF x 1' width reduction/lane x 2 lanes = 78,336 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-2	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION: FOR URBAN SECTIONS USE A 16' WIDE RAISED MEDIAN IN LIEU OF A 20' RAISED MEDIAN.

ORIGINAL DESIGN: In the current design, Typical Urban Sections #3 and #4 from Sta 499+65 to Sta 722+34 have a 20' raised median.

PROPOSED CHANGE: It is proposed to change the width of the raised median from 20 feet to 16 feet for urban sections #3 and #4.

JUSTIFICATION: A 16' raised median is being used on other GDOT projects and AASHTO Chapter 7 (2004) allows a median width of 16' for Arterial roadways. This does, however, require a design variance from GDOT.

ADVANTAGES:

- Reduces project cost
- Reduces fill in Lake Oconee
- Less impact to adjacent property
- Allows use of minimum right of way in critical areas

DISADVANTAGES:

- Requires a Design Variance from GDOT

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,969,171		\$ 1,969,171
PROPOSED CHANGE:	\$ 1,746,474		\$ 1,746,474
SAVINGS:	\$ 222,697		\$ 222,697

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-2	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
206-0002 Borrow Excav	1	CY	510000	\$3.86	\$1,969,171
208-0200 Rock Embankment	3	CY	Not in estimate	\$13.58	Not in estimate
SUBTOTAL – COST TO PRIME					\$1,969,171
MARKUP					Incl.
TOTAL CONTRACT COST					\$1,969,171

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
206-0002 Borrow Excav	1	CY	484,963	\$3.86	\$1,871,957
208-0200 Rock Embankment (Red.)	3	CY	-9,237	\$13.58	(\$125,483)
SUBTOTAL – COST TO PRIME					\$1,746,474
MARKUP					Incl.
TOTAL CONTRACT COST					\$1,746,474

Difference [Original-Proposed] **\$222,697**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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) |
|---|--|

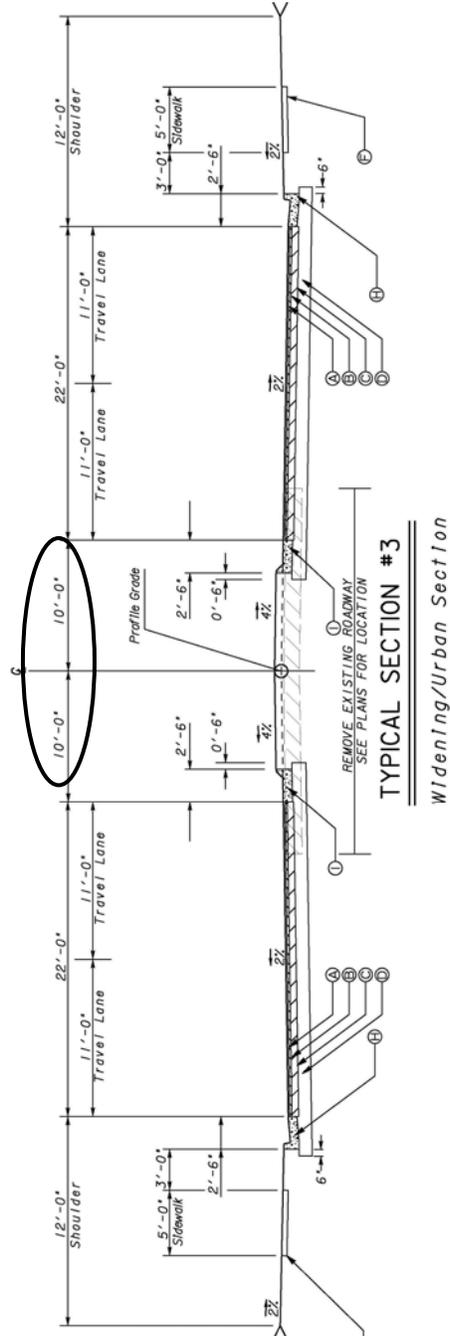
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-2

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

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



CALCULATIONS

PROPOSAL NUMBER: R2-2

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Typical Section #3 and #4 Sta 499+65 to Sta 731+00 = 23,135 lf
Roadway across Lake = 6,235 lf requiring rock embankment
 $23,135 - 6,235 = 16,900$ lf requiring earth fill

- Footprint reduced by 4' by using 16' median in lieu of 20'
- Assume average height of fill at 10' based on review of project cross sections

$16,900 \text{ lf} \times 4' \text{ w} \times 10' \text{ h} = 676,000 \text{ cf} / 27 = 25,037 \text{ cy}$ less borrow material

- Item 206-0002 Borrow @ \$3.86/cy
 $25,037 \text{ cy} \times \$3.86 = \$96,643$ reduction in earth fill
 $510,000 \text{ cy} \text{ minus } 25,037 \text{ cy} = 484,963 \text{ cy}$

Note: Rock embankment was not included in the original cost estimate but is required for the fill in the lake.

$6,235 \text{ lf} \times 4' \text{ w} \times 10' \text{ h} = 249,400 \text{ cf} / 27 = 9,237 \text{ cy}$ less rock embankment

- Item 208-0200 Rock Embankment @ \$13.58
 $9,237 \text{ cy} \times \$13.58 = \$125,483$ reduction in rock embankment

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-4	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION: FOR 2-LANE SIDE STREET SECTIONS USE 11' LANE WIDTHS IN LIEU OF 12'.

ORIGINAL DESIGN: In the current design, the vast majority of the 2-lane side street sections are shown as 12' travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on the side street sections from 12' to 11'.

JUSTIFICATION: Based on the current plans, the existing side streets appear to be less than 12' in lane width and GDOT design policy allows 11' lanes for local roads as indicated on Table 6.4 of the Design Policy Manual.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 64,914		\$ 64,914
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 64,914		\$ 64,914

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-4	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	13960	\$4.65	\$64,914
SUBTOTAL – COST TO PRIME					\$64,914
MARKUP					Incl.
TOTAL CONTRACT COST					\$64,914

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$64,914**

SOURCES

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

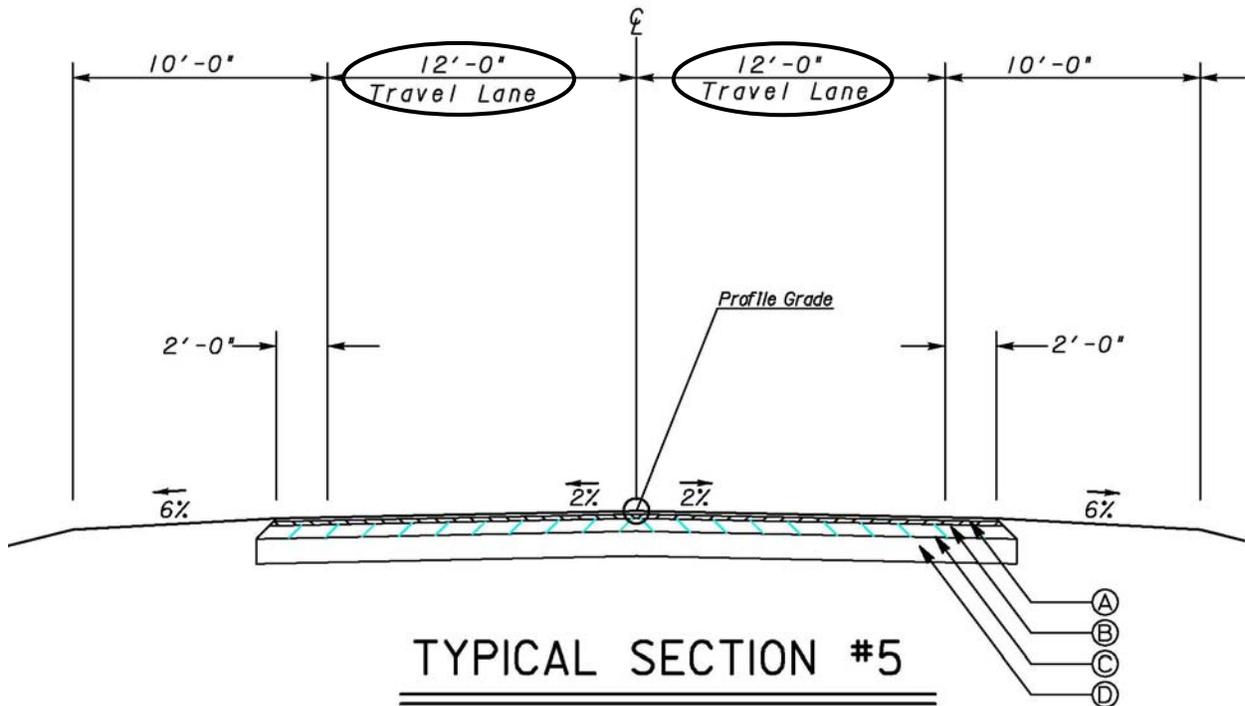
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-4

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

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



TYPICAL SECTION #5

*Rural Section
NORMAL CROWN*

LOWER HARMONY ROAD
 S. R. 44 TIE
 TANYARD ROAD
 NEW PHOENIX ROAD
 GATEWOOD ROAD
 LOCH WAY
 ALEXANDER ROAD
 NORMANDY ROAD
 BRER BEAR ROAD

BRIAR PATCH ROAD
 LAKEMORE DRIVE
 N HIDDEN LAKE DRIVE
 LAKEVIEW DRIVE
 SCOTT ROAD
 CLACK CIRCLE 1
 CLACK CIRCLE 2

CALCULATIONS

PROPOSAL NUMBER: R2-4

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF
440# Asph 19 MM = \$1.35/SF
550# Asph 25MM = \$1.70/SF
12" GAB (Ton) = \$1.05/SF
Tack Coat = \$0.02/SF
Total \$4.65/SF = \$41.85/SY

Pavement Area Calcs.

Side streets with 12' travel lanes proposed and their construction lengths are as follows:

Lower Harmony Road: 380'

Old SR 44 Tie: 400'

N. Wesley Chapel Road: 520'

Tanyard Road: 370'

New Phoenix Road Reloc: 950'

Gatewood Road Reloc: 560'

Loch Way: 300'

Alexander Road Reloc: 400'

Normandy Road: 500'

Brer Bear Road: 310'

Lakemore Drive: 290'

N Hidden Lake Drive: 130'

Lakeview Drive: 480'

Thunder Road: 200'

Scott Road: 240'

Clack Circle 1 & 2: 650'

Huntington Place: 300'

Total Length: 6,980 LF

6980 LF x 1' width reduction/lane x 2 lanes = 13,960 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-5

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: ELIMINATE 2' PAVED SHOULDER ON 2-LANE SIDE STREET SECTIONS.

ORIGINAL DESIGN: In the current design, the 2-lane rural side street sections are shown with 2' paved shoulders.

PROPOSED CHANGE: It is proposed to eliminate the 2' paved shoulders on the rural side street sections.

JUSTIFICATION: Based on GDOT design policy, rural side streets do not require a paved shoulder.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 138,756		\$ 138,756
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 138,756		\$ 138,756

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-5	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	29840	\$4.65	\$138,756
SUBTOTAL – COST TO PRIME					\$138,756
MARKUP					Incl.
TOTAL CONTRACT COST					\$138,756

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$138,756**

SOURCES

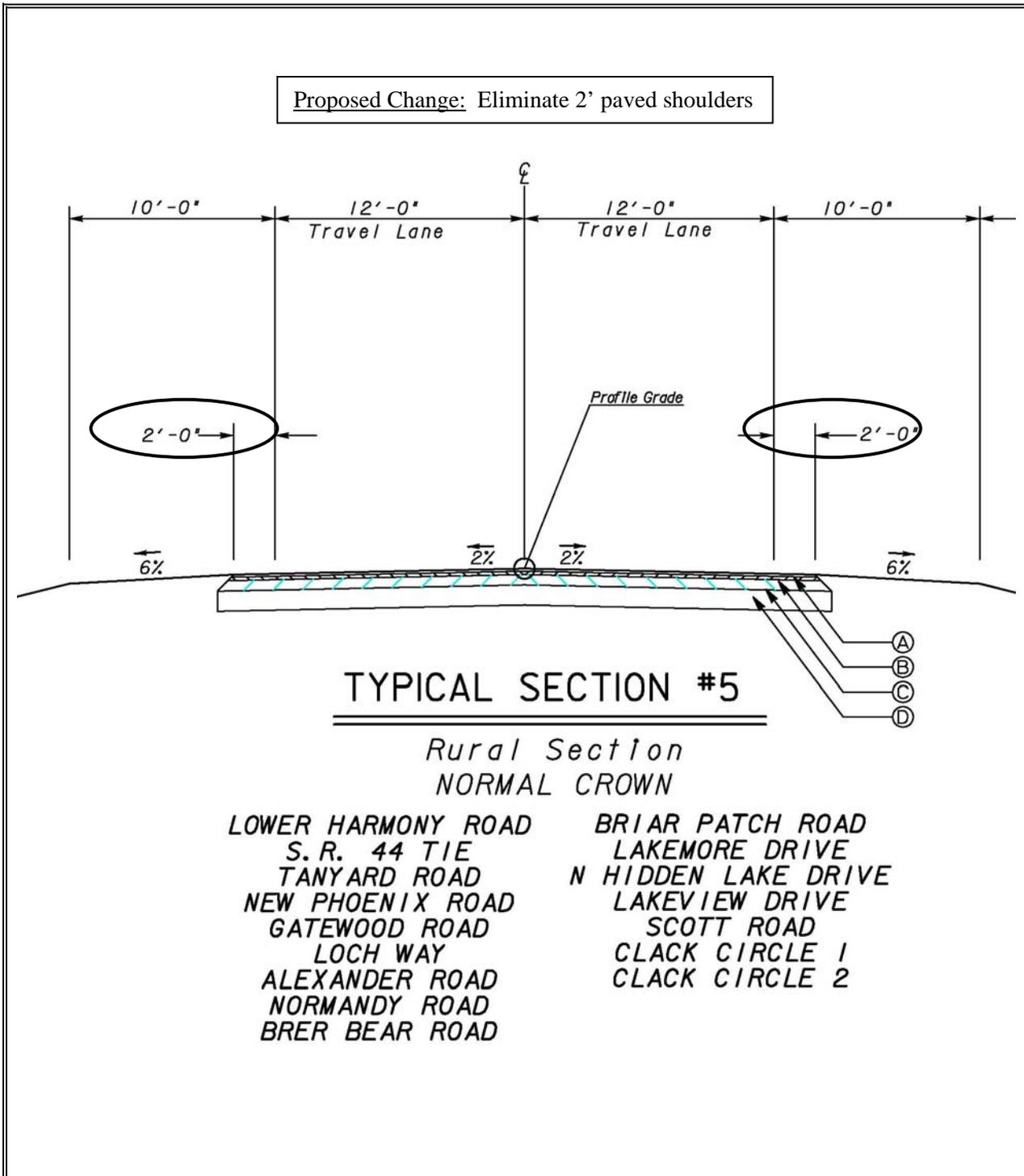
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-5

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252



CALCULATIONS

PROPOSAL NUMBER: R2-5

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF
440# Asph 19 MM = \$1.35/SF
550# Asph 25MM = \$1.70/SF
12" GAB (Ton) = \$1.05/SF
Tack Coat = \$0.02/SF
Total \$4.65/SF = \$41.85/SY

Pavement Area Calcs.

Rural side streets with 2' paved shoulders and their construction lengths are as follows:

Lower Harmony Road: 380'

Old SR 44 Tie: 400'

N. Wesley Chapel Road: 520'

Tanyard Road: 370'

New Phoenix Road Reloc: 950'

Gatewood Road Reloc: 560'

Loch Way: 300'

Alexander Road Reloc: 400'

Normandy Road: 500'

Brer Bear Road: 310'

Lakemore Drive: 290'

N Hidden Lake Drive: 130'

Lakeview Drive: 480'

Old Phoenix Road: 980'

Scott Road: 240'

Clack Circle 1 & 2: 650'

Total Length: 7,460 LF

7460 LF x 2' width reduction/side x 2 sides = 29,840 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-7

PAGE NUMBER: 1 of 5

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 US 441 to Linger Longer Road,
 Greene/Putnam County

PROPOSAL DESCRIPTION: REUSE AND OVERLAY EXISTING PAVEMENT FROM APPROXIMATE STA 332+00 TO APPROXIMATE STA 359+00 AND FROM APPROXIMATE STA 485+00 TO APPROXIMATE STA 734+00.

ORIGINAL DESIGN: The pavement for SR44 is proposed to be replaced with full depth pavement construction for the entire project.

PROPOSED CHANGE: It is proposed to utilize the existing pavement in lieu of full depth pavement from approximate Sta 332+00 to approximate Sta 359+00 and from approximate Sta 485+00 to approximate Sta 734+00.

JUSTIFICATION: An existing pavement evaluation has not been completed, but based on photo evidence the existing pavement appears usable. The profile for SR44 can be revised to closer match the existing and will meet the required 55 mph design speed in the rural section, 45 mph design speed in the urban section and will meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Reduces pavement cost
- Improves stage construction

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,729,088		\$ 2,729,088
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 2,729,088		\$ 2,729,088

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-7	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	662,400	\$4.12	\$2,729,088
SUBTOTAL – COST TO PRIME					\$2,729,088
MARKUP					Incl.
TOTAL CONTRACT COST					\$2,729,088

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] **\$2,729,088**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

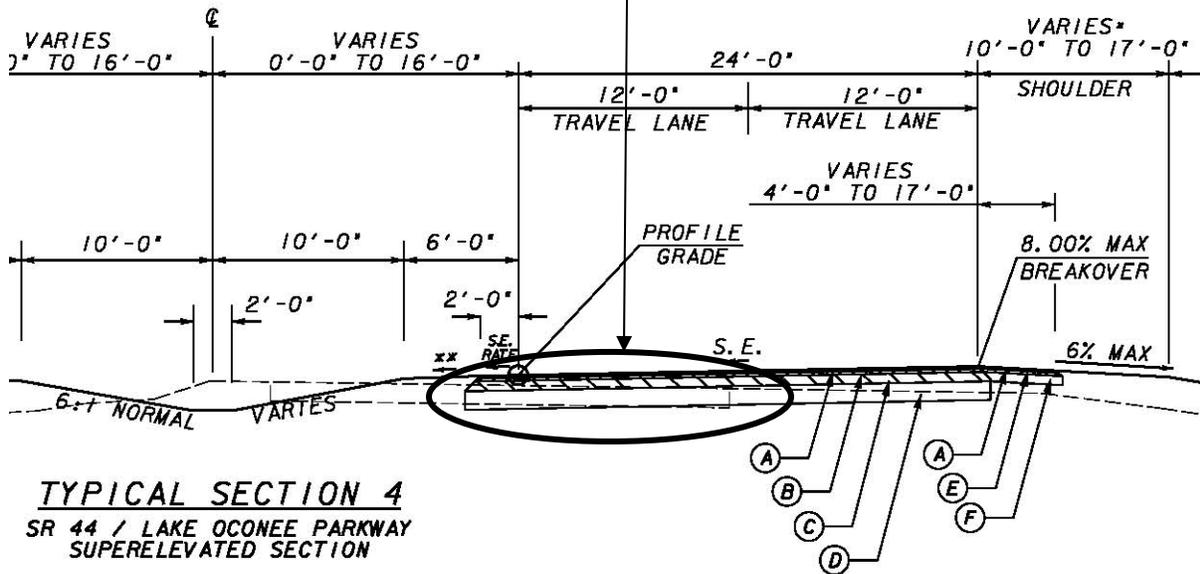
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-7

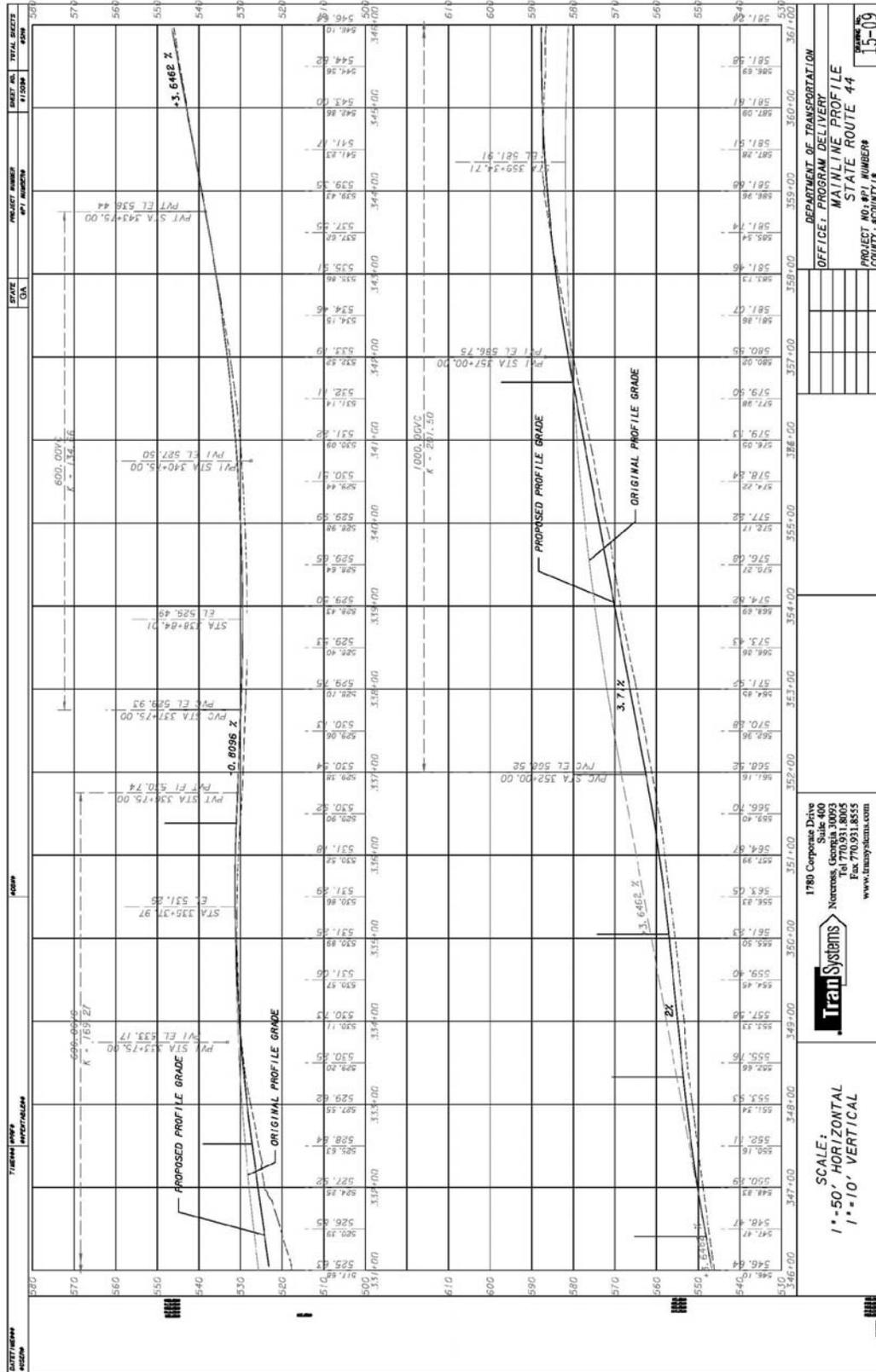
PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Proposed Change: Overlay where possible in lieu of full pavement section



TYPICAL SECTION 4
 SR 44 / LAKE OCONEE PARKWAY
 SUPERELEVATED SECTION



CALCULATIONS

PROPOSAL NUMBER: R2-7

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Pavement Cost Calculations

Full pavement section less overlay layer:

440# Asph 19 MM = \$1.35/SF

550# Asph 25MM = \$1.70/SF

12" GAB (Ton) = \$1.05/SF

Tack Coat = \$0.02/SF

Total \$4.12/SF

Pavement Area Calcs.

Sta 332+00 to Sta 359+00:

Total Length = 2,700 LF

Assumed width = 24 LF

2700 LF x 24 LF = 64,800 SF

64,800 * \$4.12 = \$266,976

Sta 485+00 to Sta 734+00:

Total Length = 24,900 LF

Assumed width = 24 LF

24900 LF x 24 LF = 597,600 SF

597600 * \$4.12 = \$2,462,112

Total Cost Savings = \$2,729,088

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-8

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: REDUCE SHOULDER WIDTH ON RURAL SIDE
 STREETS FROM 10' TO 8'.

ORIGINAL DESIGN: In the current design, the rural side street sections are shown with 10' total shoulder width.

PROPOSED CHANGE: It is proposed to reduce the total shoulder width on the rural side street sections from 10' to 8'.

JUSTIFICATION: Based on GDOT design policy, an 8' shoulder width on rural side streets is allowed.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,454		\$ 1,454
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 1,454		\$ 1,454

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-8	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Unclass Excavation (reduction)	1/7	CY	240	\$4.21	\$1,010
Borrow (reduction)	1/7	CY	120	\$3.70	444
SUBTOTAL – COST TO PRIME					\$1,454
MARKUP					Incl.
TOTAL CONTRACT COST					\$1,454

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$1,454**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

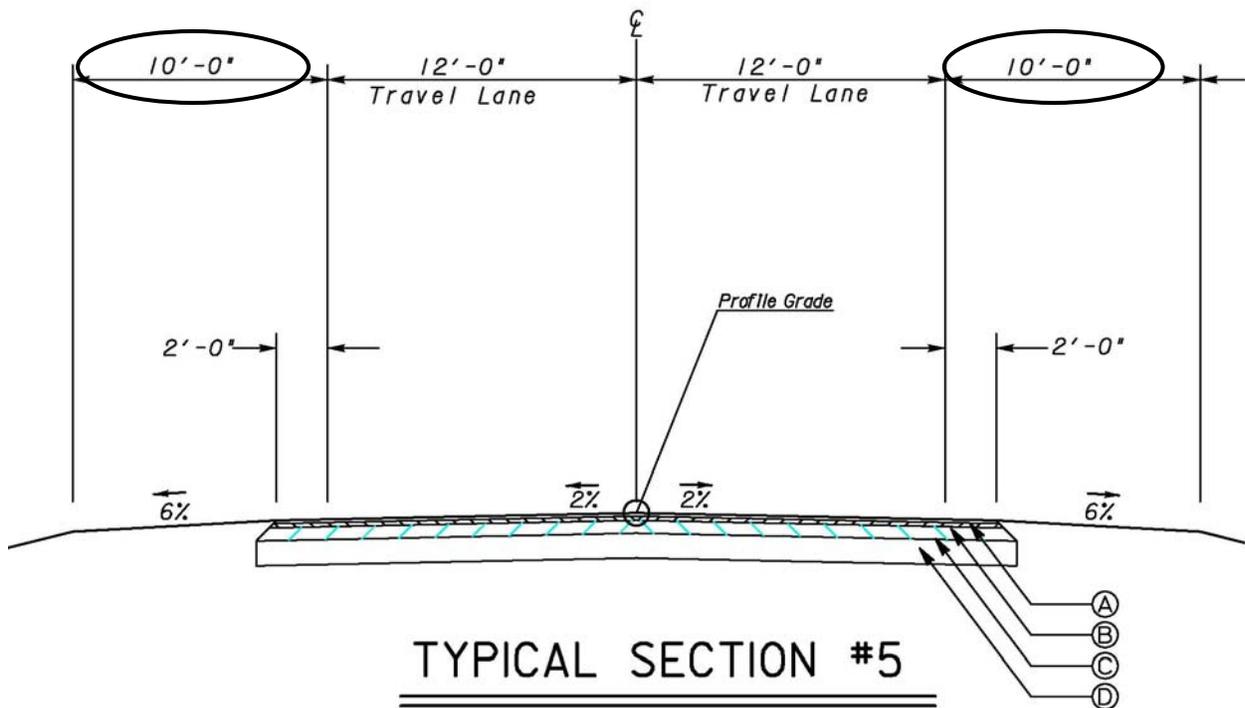
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-8

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Proposed Change: Reduce total shoulder width from 10' to 8'



*Rural Section
NORMAL CROWN*

LOWER HARMONY ROAD
S. R. 44 TIE
TANYARD ROAD
NEW PHOENIX ROAD
GATEWOOD ROAD
LOCH WAY
ALEXANDER ROAD
NORMANDY ROAD
BRER BEAR ROAD

BRIAR PATCH ROAD
LAKEMORE DRIVE
N HIDDEN LAKE DRIVE
LAKEVIEW DRIVE
SCOTT ROAD
CLACK CIRCLE 1
CLACK CIRCLE 2

CALCULATIONS

PROPOSAL NUMBER: R2-8

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Side Street Calcs.

Rural side streets and their construction lengths are as follows:

Lower Harmony Road: 380'

Old SR 44 Tie: 400'

N. Wesley Chapel Road: 520'

Tanyard Road: 370'

New Phoenix Road Reloc: 950'

Gatewood Road Reloc: 560'

Loch Way: 300'

Alexander Road Reloc: 400'

Normandy Road: 500'

Brer Bear Road: 310'

Lakemore Drive: 290'

N Hidden Lake Drive: 130'

Lakeview Drive: 480'

Scott Road: 240'

Clack Circle 1 & 2: 650'

Total Length: 6,480 LF

6480 LF x 2 sides = 12,960 LF

At a 4:1 slope for the 2' horizontal distance, for every 1 LF of distance, have 0.5 CF earthwork, or $12,960 \times 0.5 = 6,480 \text{ CF} / 27 = 240 \text{ CY}$

Assume balanced site, so included 50% borrow, or 120 CY

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-9

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: REDUCE SHOULDER WIDTH ON URBAN SIDE
 STREETS FROM 12' TO 10'

ORIGINAL DESIGN: In the current design, the urban side street sections are shown with 12' total shoulder width.

PROPOSED CHANGE: It is proposed to reduce the total shoulder width on the urban side street sections from 12' to 10'.

JUSTIFICATION: Based on GDOT design policy, a 10' shoulder width on urban side streets is allowed.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 449		\$ 449
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 449		\$ 449

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R2-9	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Unclass Excavation (reduction)	1/7	CY	74	\$4.21	\$312
Borrow (reduction)	1/7	CY	37	\$3.70	137
SUBTOTAL – COST TO PRIME					\$449
MARKUP					Incl.
TOTAL CONTRACT COST					\$449

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$449**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

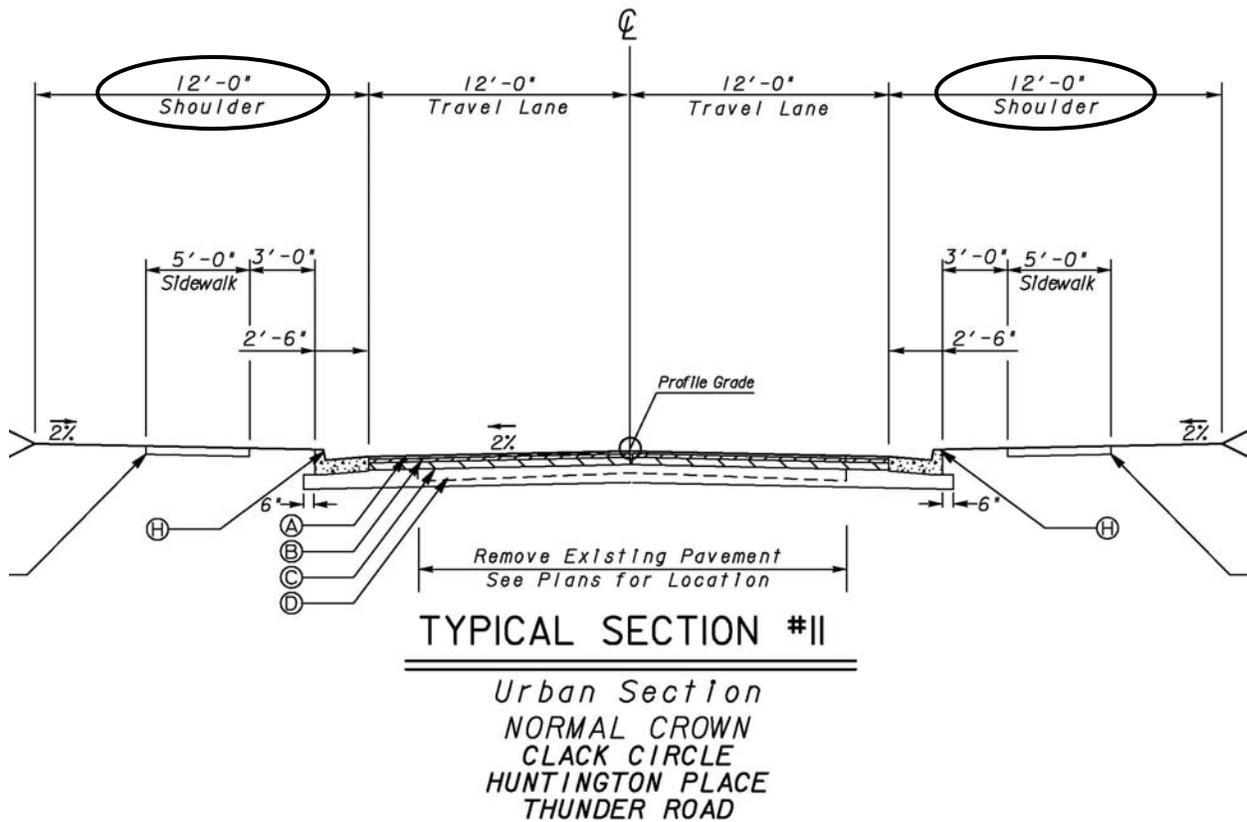
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R2-9

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Proposed Change: Reduce total shoulder width from 12' to 10'



CALCULATIONS

PROPOSAL NUMBER: R2-9

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Side Street Calcs.

Urban side streets and their construction lengths are as follows:

Old Phoenix Road: 725'

Harmony Road: 750'

Thunder Road: 200'

Huntington Place: 300'

Total Length: 1,975 LF

1975 LF x 2 sides = 3,950 LF

At a 4:1 slope for the 2' horizontal distance, for every 1 LF of distance, have 0.5 CF earthwork,
or $3,950 \times 0.5 = 1,975 \text{ CF} / 27 = 74 \text{ CY}$

Assume balanced site, so included 50% borrow, or 37 CY

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-10

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: REDUCE THE REQUIRED RIGHT OF WAY WIDTH FROM 200' TO 140' AND USE PERMANENT EASEMENT OUTSIDE OF RIGHT OF WAY.

ORIGINAL DESIGN: The original design has a required right of way corridor of 200' or more at various and multiple locations throughout the project limits.

PROPOSED CHANGE: It is proposed to reduce the required right of way corridor to a maximum of 140' and use permanent easement beyond the right of way.

JUSTIFICATION: Acquiring right of way using a typical width right of way corridor with easements is a common GDOT practice in developed or soon to develop areas.

ADVANTAGES:

- Reduces project cost
- Allows property owner ability to use land for certain activities such as parking after project is complete

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 10,033,000		\$ 10,033,000
PROPOSED CHANGE:	\$ 9,639,000		\$ 9,639,000
SAVINGS:	\$ 394,000		\$ 394,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-10	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Part 1 Right of Way	1				\$3,668,000
Part 2 Right of Way	1				\$6,365,000
SUBTOTAL – COST TO PRIME					\$10,033,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$10,033,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Part 1 Right of Way	7		See calculations sheet		\$3,542,000
Part 2 Right of Way	7		See calculations sheet		\$6,097,000
SUBTOTAL – COST TO PRIME					\$9,639,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$9,639,000

Difference [Original-Proposed] **\$394,000**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (Revised ROW Cost Estimate Summary) |
|---|--|

CALCULATIONS

PROPOSAL NUMBER: R2-10

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Part 1 Right of Way Cost Estimate (From US441 to Alexander Road) = \$3,668,000 from estimate dated 8/7/12

Review of construction plans shows approximate 50 parcels in Part 1 using the 200' right of way width. The scaled length of this right of way is approximately 61,030 linear feet of frontage. Reducing the right of way from 200' to 140' or 100' to 70' per side reduces the required right of way by 30'. It was assumed that all of the parcels were residential.

$61,030 \text{ lf} \times 30' = 1,830,900 \text{ sf} / 43560 = 42.03$ acres changing from right of way to easement (this area can be reduced further by setting the easement 5' to 10' beyond the construction limit but this was not done for this estimate)

Reducing the right of way area by 42.03 acres and increasing the easement area by 42.03 acres in the 8/7/12 cost estimate produces a revised estimate of \$3,542,000.

Part 2 Right of Way Cost Estimate (From US441 to Alexander Road) = \$6,365,000 from estimate dated 8/7/12

Review of construction plans shows approximate 7 parcels in Part 2 using the 200' right of way width. The scaled length of this right of way is approximately 5420 linear feet of residential frontage and 5000 linear feet of commercial frontage. Reducing the right of way from 200' to 140' or 100' to 70' per side reduces the required right of way by 30'.

Residential: $5420 \text{ lf} \times 30' = 162,600 \text{ sf} / 43560 = 3.73$ acres changing from right of way to easement (this area can be reduced further by setting the easement 5' to 10' beyond the construction limit but this was not done for this estimate)

Commercial $5000 \text{ lf} \times 30' = 150,000 \text{ sf} / 43560 = 3.44$ acres changing from right of way to easement (this area can be reduced further by setting the easement 5' to 10' beyond the construction limit but this was not done for this estimate)

Reducing the residential right of way area by 3.73 acres and increasing the easement area by 3.73 acres in the 8/7/12 cost estimate and reducing the commercial right of way area by 3.44 acres and increasing the easement area by 3.44 acres in the 8/7/12 cost estimate produces a revised estimate of \$6,097,000.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-11	PAGE NUMBER: 1 of 8
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 from US 441 to Linger Longer Road, Greene/Putnam Counties

PROPOSAL DESCRIPTION:	REVISE THE VERTICAL PROFILE FROM STA 115+00 TO STA 234+00 TO REDUCE THE VOLUME OF EARTHWORK.
------------------------------	---

ORIGINAL DESIGN: The original vertical profile does not follow the existing terrain or the existing roadway elevations from Sta 115+00 to Sta 234+00 causing excessive cuts and fills in those areas.

PROPOSED CHANGE: It is proposed to develop a vertical profile from Sta 115+00 to Sta 234+00 that more closely follows the existing terrain or roadway and still meets the desired speed design of 55 mph. The bridge over Rooty Creek will also be lowered to reduce the length and therefore will reduce the cost. (See B2-1 for additional bridge information)

JUSTIFICATION: The vertical alignment can be revised to reduce earthwork and still maintain the required design speed of 55 mph and meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Reduces project earthwork cost
- Reduces impacts to adjacent property

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 4,531,459		\$ 4,531,459
PROPOSED CHANGE:	\$ 4,146,324		\$ 4,146,324
SAVINGS:	\$ 385,135		\$ 385,135

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-11	PAGE NUMBER:	2 of 8
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @90 x 40	1	SF	7,065	\$66.24	\$468,000
205-0001 Unclass Excav	1	CY	800,000	\$2.61	\$2,094,288
206-0002 Borrow Excav	1	CY	510,000	\$3.86	\$1,969,171
SUBTOTAL – COST TO PRIME					\$4,531,459
MARKUP					Incl.
TOTAL CONTRACT COST					\$4,531,459

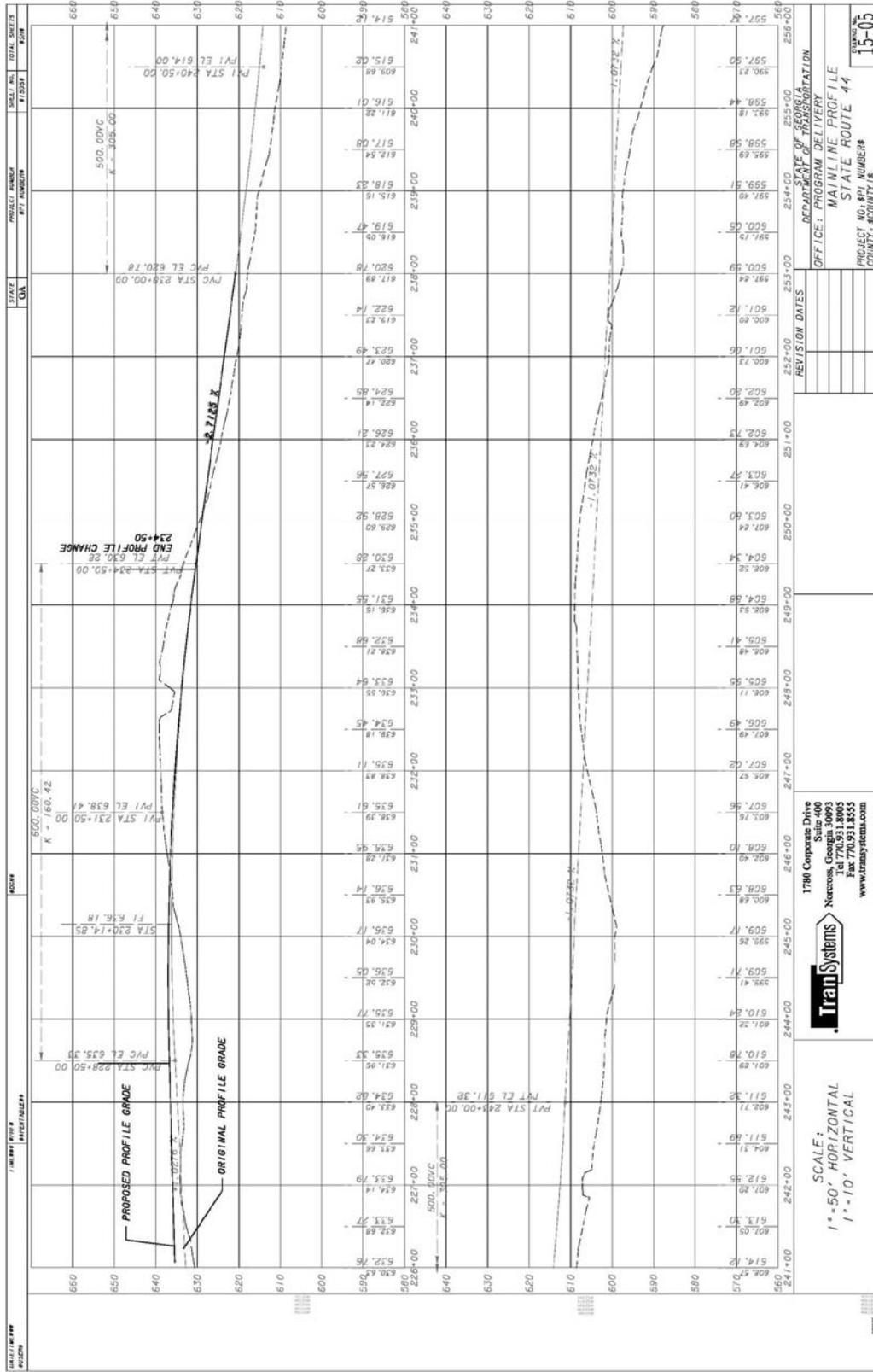
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @90 x 40	7	SF	6,123 (See B2-1)	\$66.24	\$405,600
205-0001 Unclass Excav	1	CY	740948	\$2.61	\$1,933,874
206-0002 Borrow Excav	1	CY	468096	\$3.86	\$1,806,850
SUBTOTAL – COST TO PRIME					\$4,146,324
MARKUP					Incl.
TOTAL CONTRACT COST					\$4,146,324

Difference [Original-Proposed] **\$385,135**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (See VE B2-1) |
|---|--|



CALCULATIONS

PROPOSAL NUMBER: R2-11

PAGE NUMBER: 8 of 8

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Assume roadway paving quantities remain the same.

Earthwork:

Difference in Cut		Difference in Fill	
STA 115+00 to STA 234+00			
UNCLASS EXCAV		BORROW	
-31.6		317.4	
-2165.8		-1664	
177.4		2731.1	
19.6		1721.4	
-3917.5		-4636	
-3891.4		-338.5	
576.8		-81.4	
39		-8781.7	
1296		105.5	
-5314		1197.7	
-75.2		0	
13286.7	sf	9428.5	sf
120	ft	120	ft
1594404	cf	1131420	cf
59052	cy	41904	cy
\$2.61		\$3.86	\$/cy
\$154,125.72		\$161,751.16	\$315,876.88

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-12	PAGE NUMBER: 1 of 17
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
PROJECT TITLE:	SR 44 US 441 to Linger Longer Road, Greene/Putnam County

PROPOSAL DESCRIPTION:	REVISE HORIZONTAL ALIGNMENT FROM APPROXIMATE STA 393+00 TO APPROXIMATE STA 490+00 TO CLOSER MATCH EXISTING ALIGNMENT AND AVOID TWO (2) RIGHT OF WAY DISPLACEMENTS ON THE WEST SIDE OF SR44 AROUND STA 401+00 AND STA 414+00.
------------------------------	--

ORIGINAL DESIGN: In the current design, the alignment of SR44 is shifted to the West as it approaches the historical resource at Sta 418+00 and shifts to the East in order to minimize impacts to this resource.

PROPOSED CHANGE: It is proposed to shift the horizontal alignment of SR44 to more closely follow the existing alignment and avoid the displacements on the West side of the road.

JUSTIFICATION: With the removal of the eligibility of the historic resource on the West side of SR 44 at Sta. 414+00 the alignment of SR44 can be revised to closer match the existing and will meet the required 55 mph design speed in the rural section and will meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Avoids two (2) right of way displacements
- Reduces right of way cost
- Reduces impacts to remaining historical resource

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 3,668,000		\$ 3,668,000
PROPOSED CHANGE:	\$ 3,551,000		\$ 3,551,000
SAVINGS:	\$ 117,000		\$ 117,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-12	PAGE NUMBER:	2 of 17
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	1				\$3,668,000
SUBTOTAL – COST TO PRIME					\$3,668,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$3,668,000

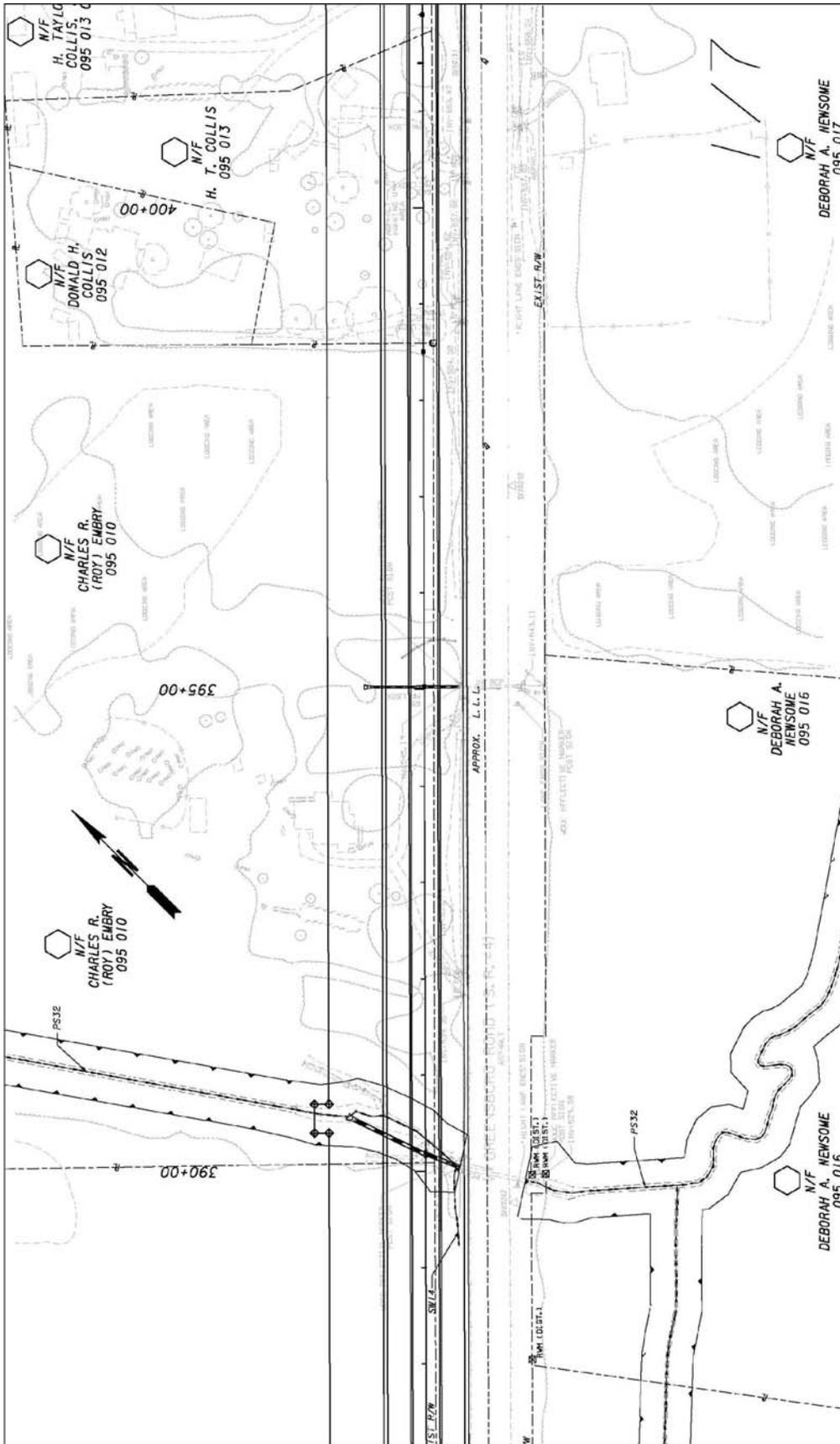
PROPOSED CHANGE

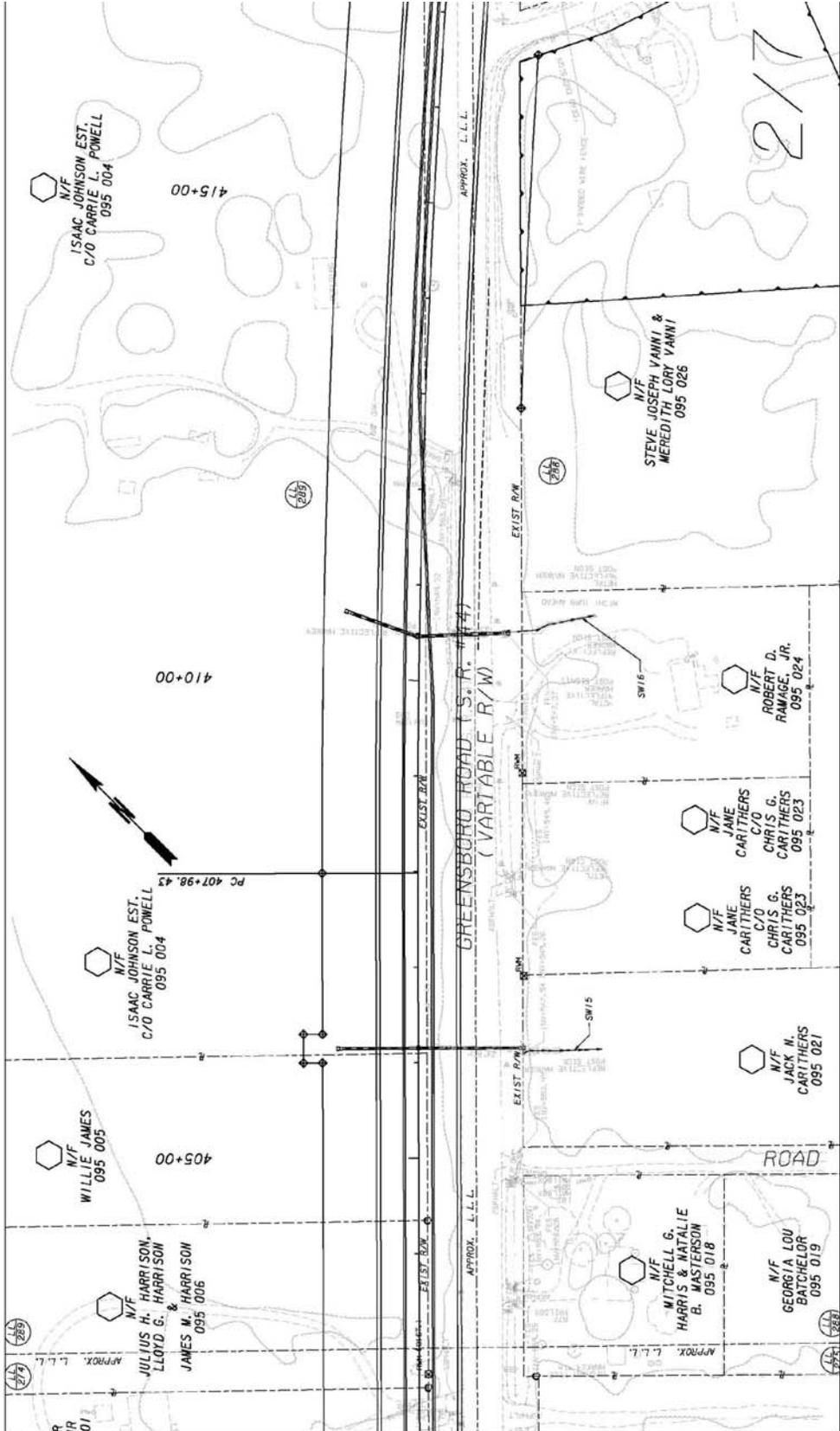
ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	7				\$3,551,000
SUBTOTAL – COST TO PRIME					\$3,551,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$3,551,000

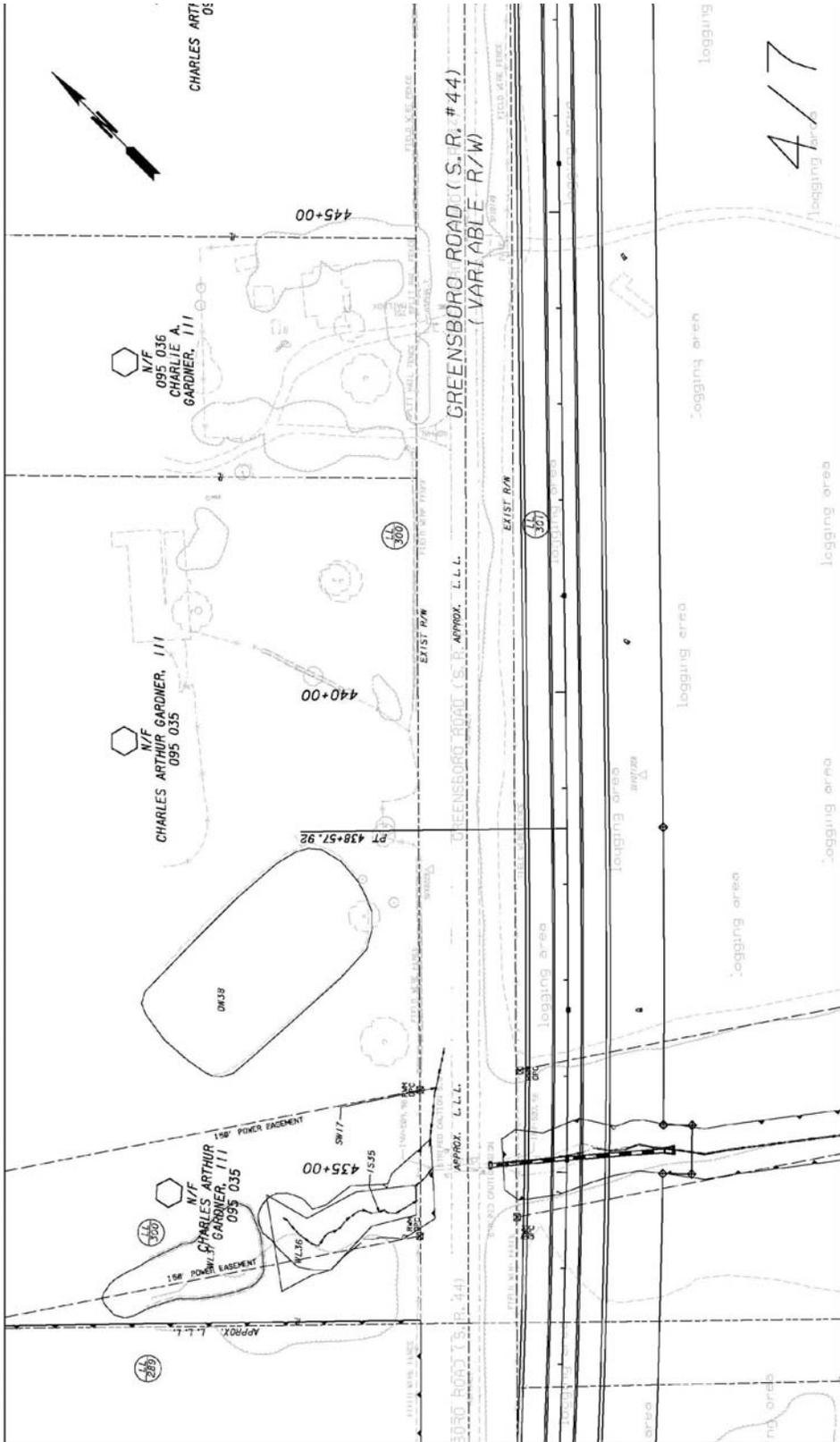
Difference [Original-Proposed] **\$117,000**

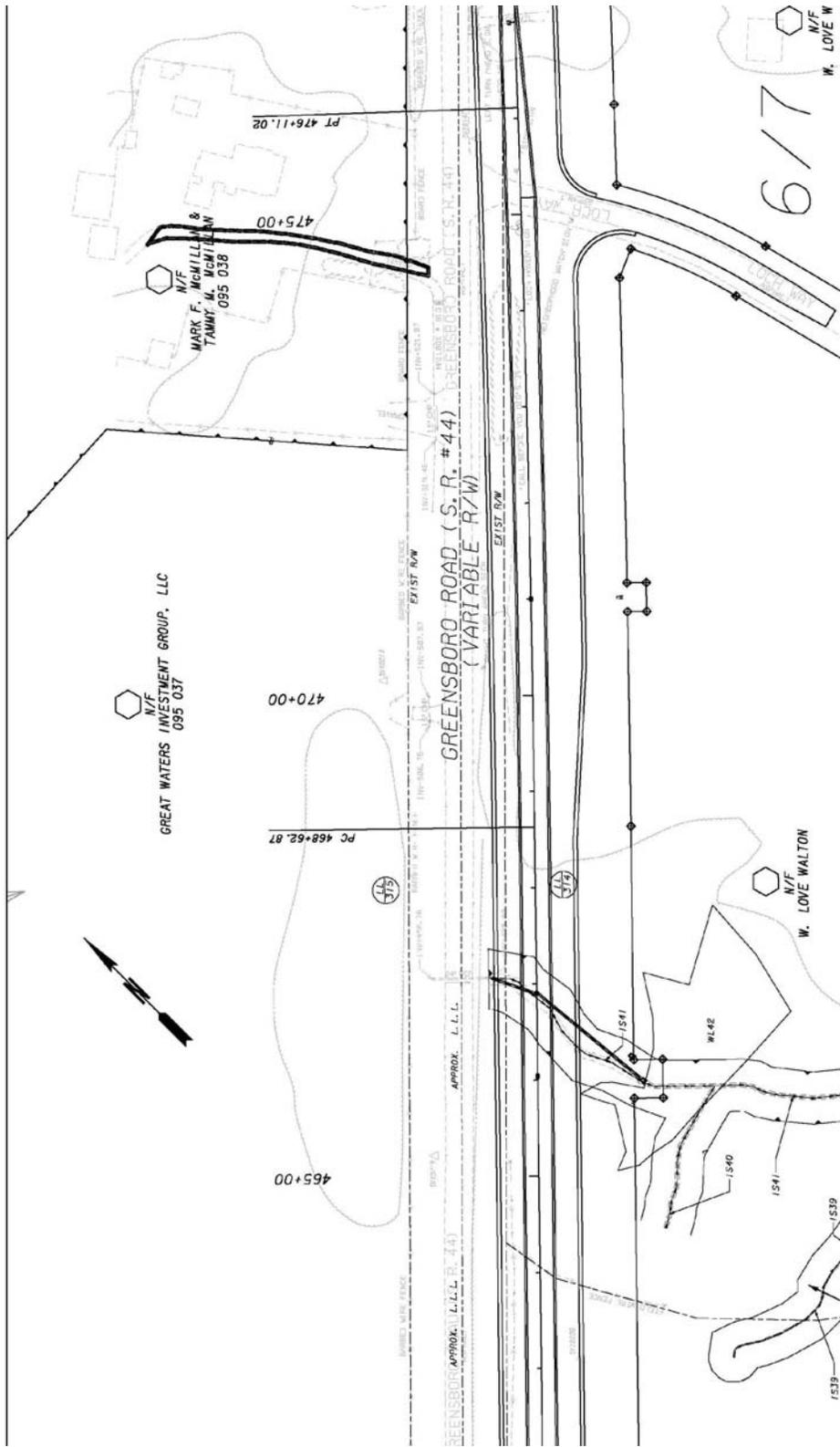
SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (Revised ROW Cost Estimate Summary) |
|---|--|

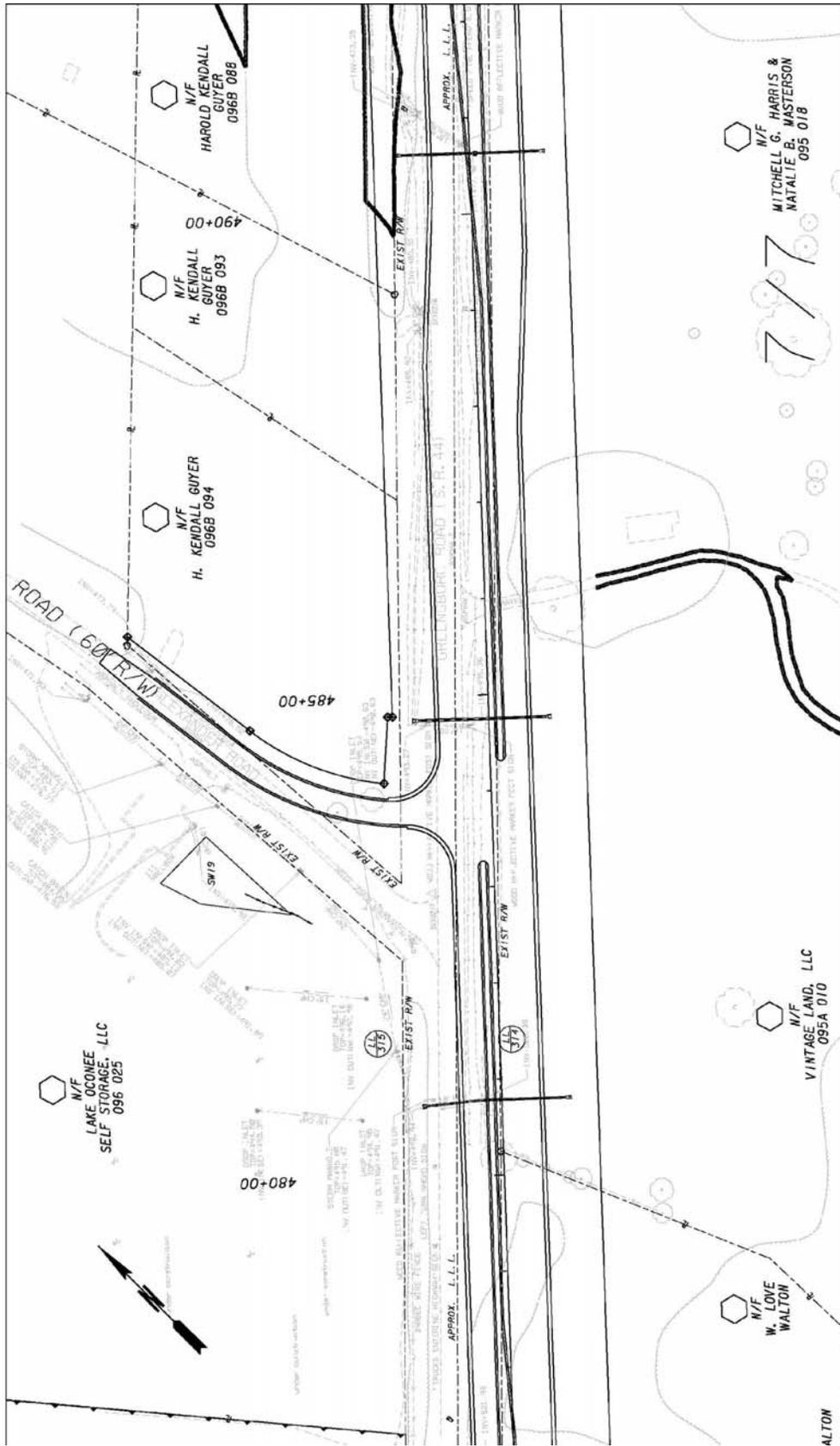


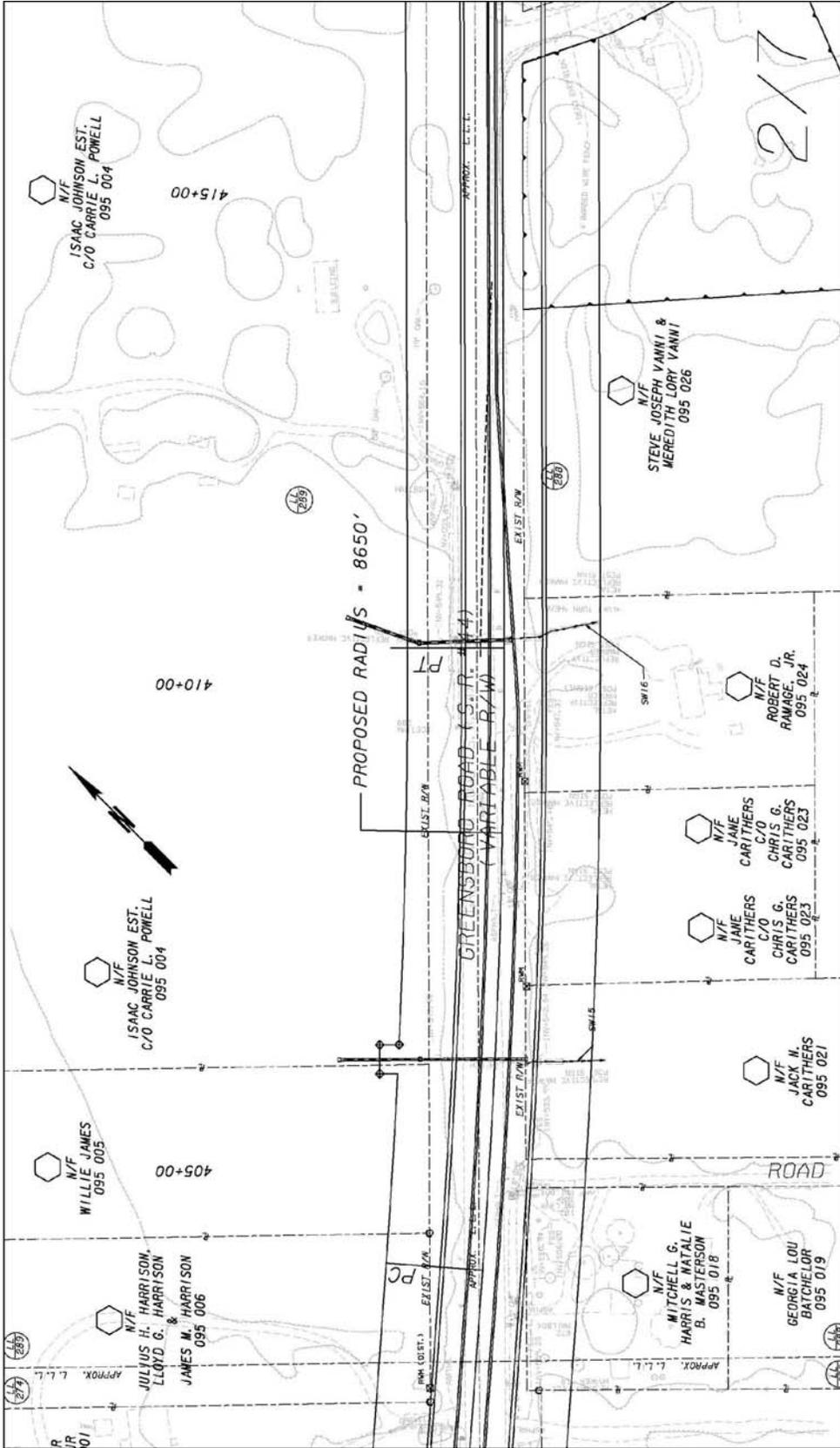


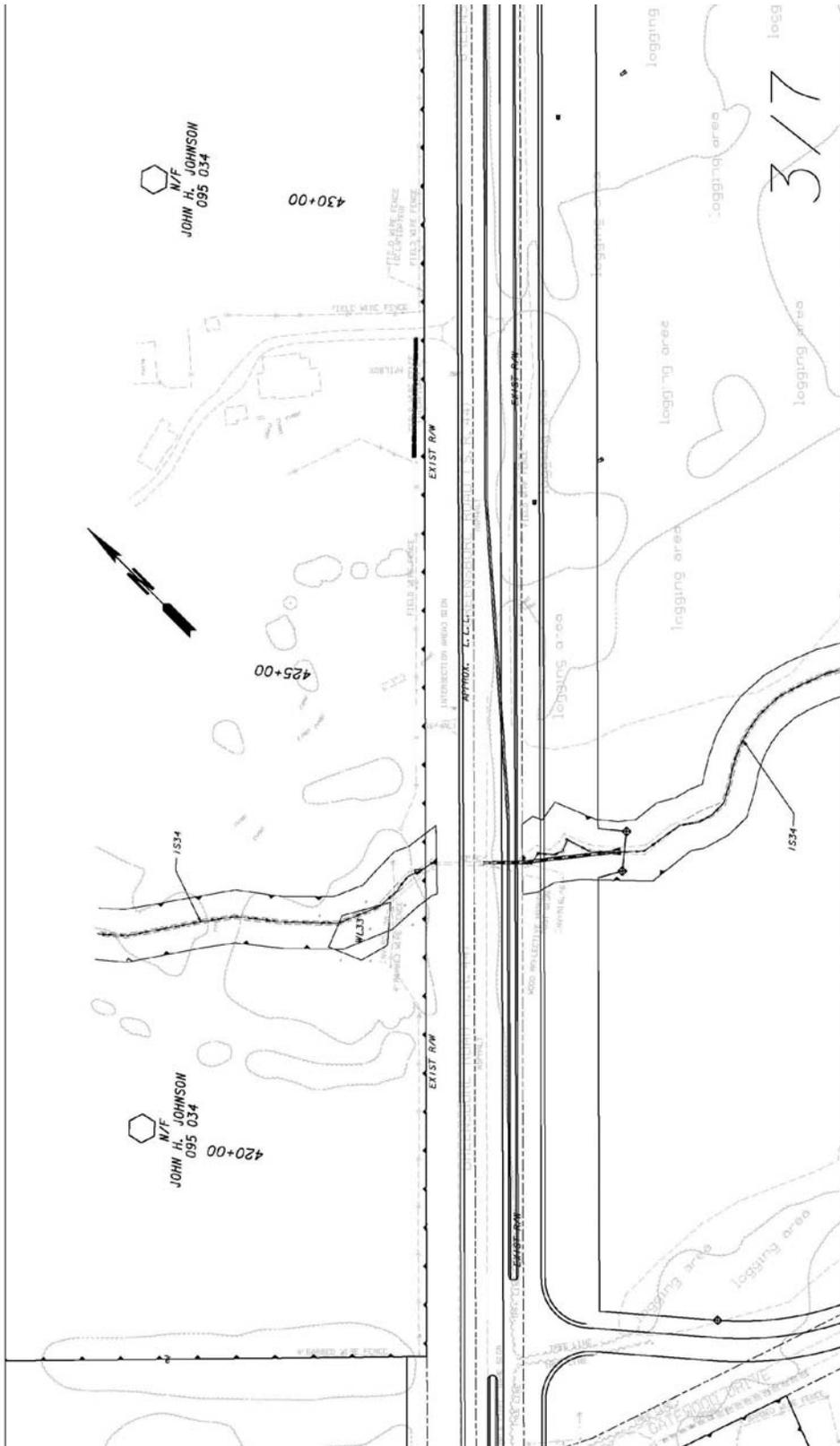


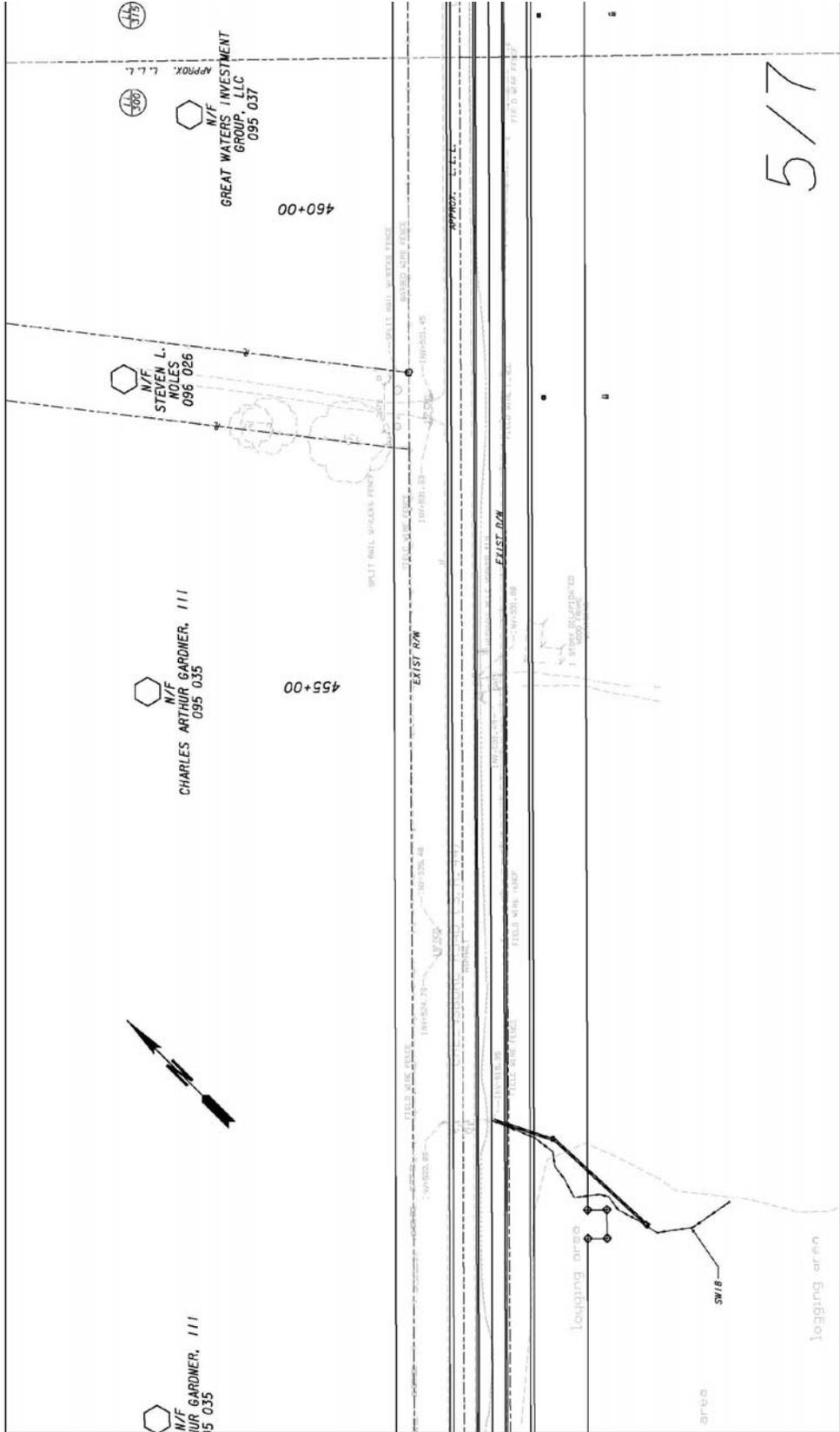


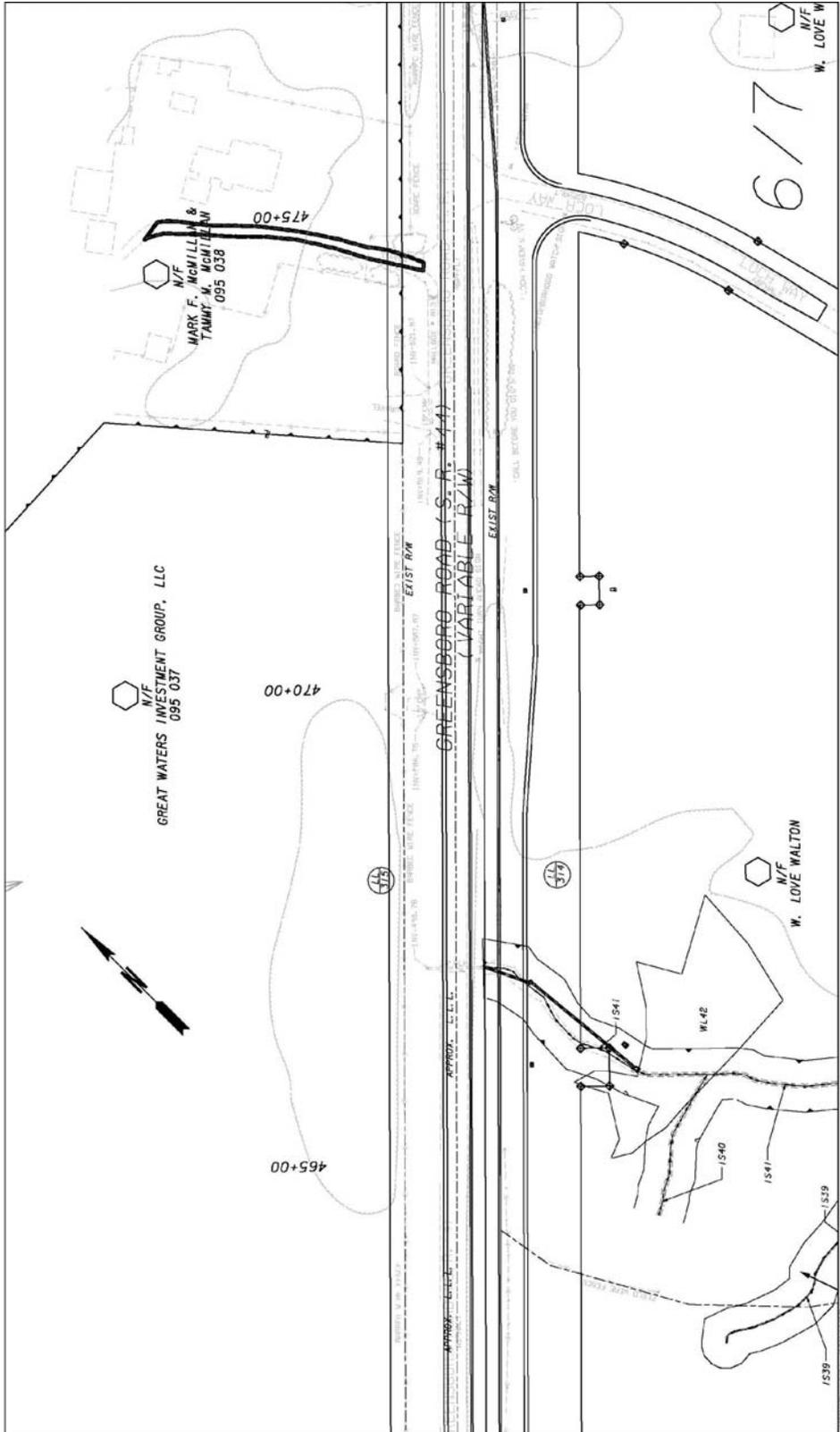
R2-12 Original Design
8 of 17











VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R2-16

PAGE NUMBER: 1 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252
PROJECT TITLE: SR 44 from US 441 to Linger Longer Road,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: REVISE THE VERTICAL PROFILE FROM STA 297+00 TO STA 370+00 TO REDUCE THE VOLUME OF EARTHWORK.

ORIGINAL DESIGN: The original vertical profile does not follow the existing terrain or the existing roadway elevations causing excessive cuts and fills in those areas.

PROPOSED CHANGE: It is proposed to develop a vertical profile that more closely follows the existing terrain or roadway and still meets the desired speed design of 55 mph. The bridge over Crooked Creek will also be lowered to reduce the length and therefore will reduce the cost. (See B2-2 for additional bridge information).

JUSTIFICATION: The vertical alignment can be revised to reduce earthwork and still maintain the required design speed of 55 mph and meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Reduces project earthwork cost
- Reduces impacts to adjacent property

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 4,687,459		\$ 4,687,459
PROPOSED CHANGE:	\$ 4,476,926		\$ 4,476,926
SAVINGS:	\$ 210,533		\$ 210,533

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R2-16	PAGE NUMBER:	2 of 6
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PROJECT #/PI #:	CSSTP-0006-00(252) / 0006252
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @120 x 40	1	SF	9,420	\$66.24	\$624,000
205-0001 Unclass Excav	1	CY	800,000	\$2.61	\$2,094,288
206-0002 Borrow Excav	1	CY	510,000	\$3.86	\$1,969,171
SUBTOTAL – COST TO PRIME					\$4,687,459
MARKUP					Incl.
TOTAL CONTRACT COST					\$4,687,459

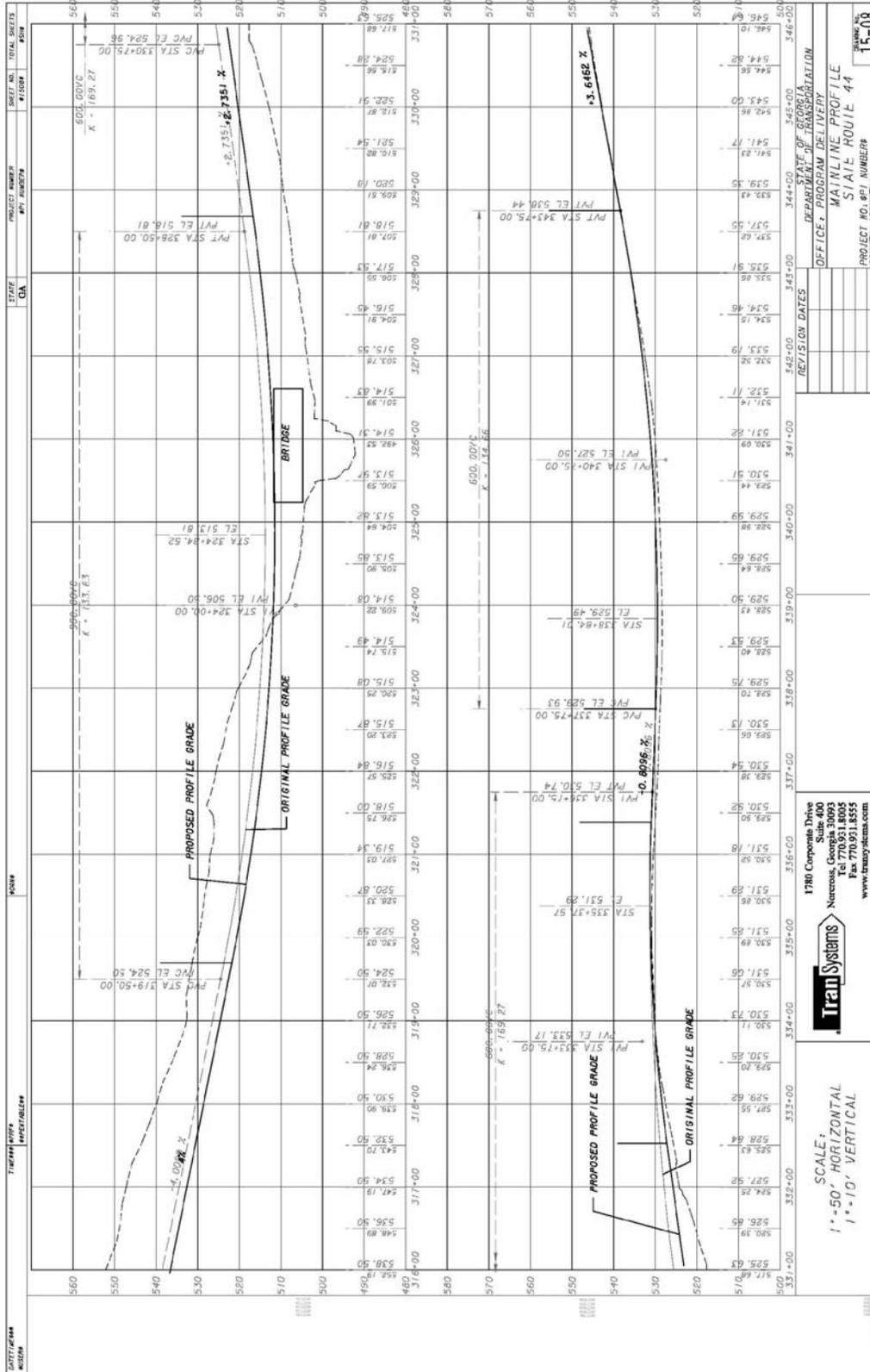
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Const of Bridge Complete #1 over Rooty Creek 2 @110 x 40	1	SF	8,635 (See B2-2)	\$66.24	\$572,000
205-0001 Unclass Excav	1	CY	786,900	\$2.61	\$2,053,809
206-0002 Borrow Excav	1	CY	479,580	\$3.86	\$1,851,117
SUBTOTAL – COST TO PRIME					\$4,476,926
MARKUP					Incl.
TOTAL CONTRACT COST					\$4,476,926

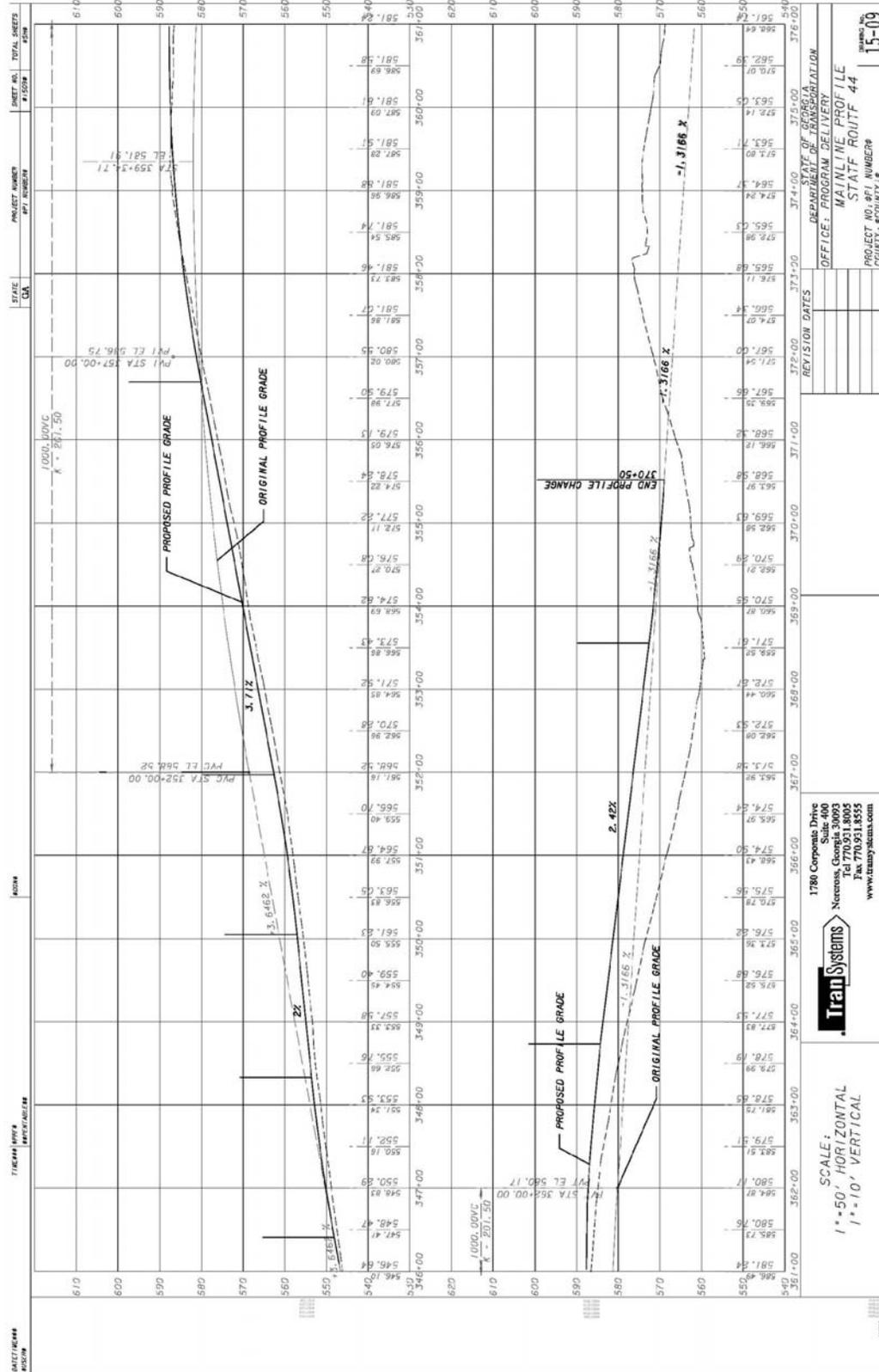
Difference [Original-Proposed] **\$210,533**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (See VE B2-2) |
|---|--|



R2-16 Proposed Change
 4 of 6



CALCULATIONS

PROPOSAL NUMBER: R2-16

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0006-00(252) / 0006252

Assumed roadway paving quantities remain the same

Earthwork:

STA 297+00 to STA 370+00			
UNCLASS EXCAV		BORROW	
Difference in Cut		Difference in Fill	
89.4		-3954.6	
351.2		-2304.2	
1270.2		-3467.9	
-2133.1		101.1	
-2525.3		2781.1	
2947.6	sf	6844.5	sf
120	ft	120	ft
353712	cf	821340	cf
13100	cy	30420	cy
\$2.61		\$3.86	\$/cy
\$34,192.16		\$117,421.20	\$151,613.36

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B3-4

PAGE NUMBER: 1 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253
PROJECT TITLE: SR 44 from Linger Longer Road to I-20,
 Greene/Putnam Counties

PROPOSAL DESCRIPTION: MAINTAIN EXISTING BRIDGE BASELINE FOR I-20 BRIDGE, ELIMINATE OVERLAY, AND WIDEN ONLY TO ONE SIDE.

ORIGINAL DESIGN: The Original Design widens the existing SR 44 bridge over I-20 symmetrically to avoid a minimum vertical clearance issue if all the widening occurs on one side. The design shifts the Profile Grade Line (PGL) from the existing PGL approximately 10-11 feet left and overlays the deck to obtain the desired cross slope.

PROPOSED CHANGE: It is proposed to widen the bridge on 1 side only and keep the PGL on the existing PGL.

JUSTIFICATION: The designer expressed concern that there was a vertical clearance issue with widening to one side. Options here are:

- Jacking the bridge to obtain clearance if there is a clearance problem
- Using a 63" BT with thick coping to give the appearance of a fascia beam while maintaining the existing bottom of beam elevation (approx 6" of constant coping)

ADVANTAGES:

- Single stage construction
- No need for overlay

DISADVANTAGES:

- A typical construction

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 347,193		\$ 347,193
PROPOSED CHANGE:	\$ 180,950		\$ 180,950
SAVINGS:	\$ 166,243		\$ 166,243

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B3-4	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Overlay	2	SY	1300	\$ 288.66	\$347,193
SUBTOTAL – COST TO PRIME					\$347,193
MARKUP					Incl.
TOTAL CONTRACT COST					\$347,193

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Jacking the Bridge	6	SF	18,095	\$ 10	\$180,950
SUBTOTAL – COST TO PRIME					\$180,950
MARKUP					Incl.
TOTAL CONTRACT COST					\$180,950

Difference [Original-Proposed] **\$166,243**

SOURCES

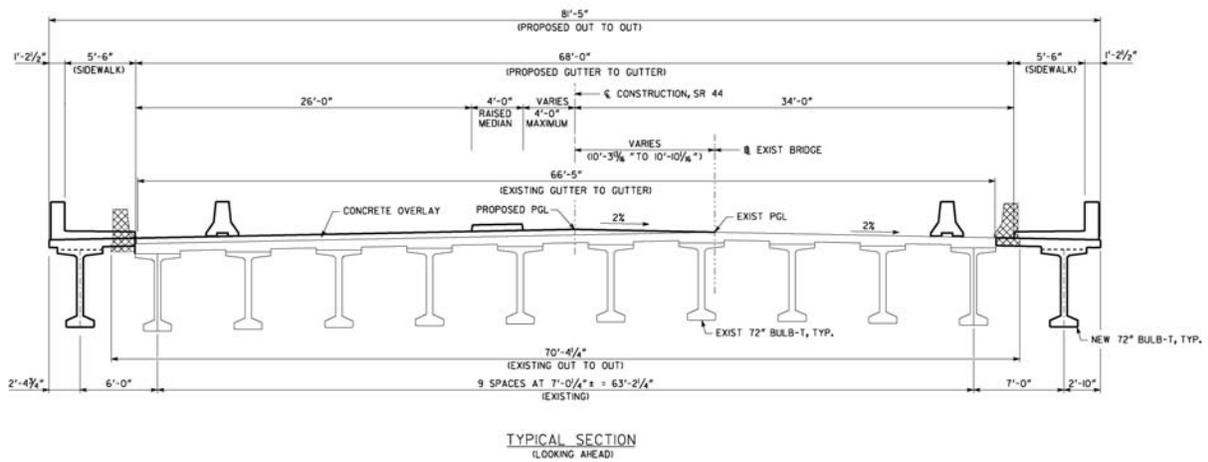
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|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other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

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B3-4

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

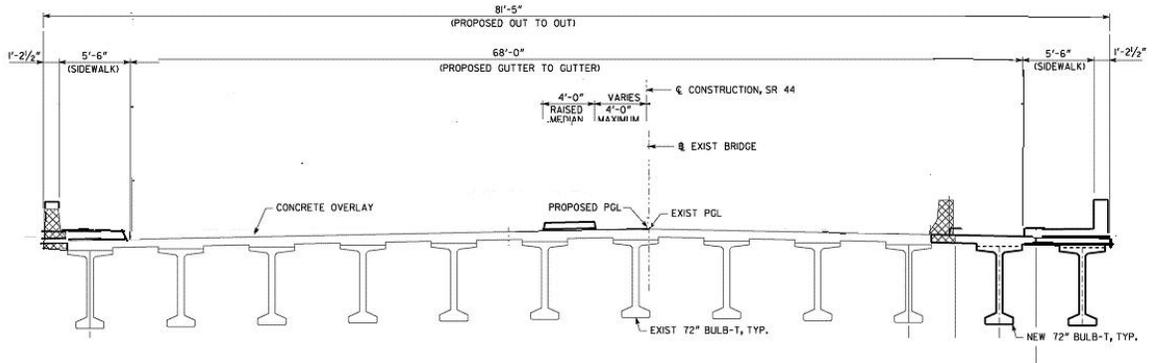


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B3-4

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253



TYPICAL SECTION
(LOOKING AHEAD)

CALCULATIONS

PROPOSAL NUMBER: B3-4

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

ORIGINAL DESIGN

Cost of Overlay:

(see Original Design Typical Section)

Width = 26 ft + 4 ft + 4 ft + 10 ft+/- = 44 ft

Length = 266.10

Area = 11,708 SF

Area = 1,300 SY

Cost = 1300 SY x \$266.88 /SY (overlay from Mean Item Summary)

Cost = \$347,193

PROPOSED CHANGE

Allowance for Jacking the Bridge:

Say \$10/SF estimate

Width = 68 FT (existing bridge width to remain)

Length = 266.1 FT

Area = 18,095 SF

Cost = 18,095 x \$10/SF = \$180,950 ← Seem high

This cost of jacking would be more than an additional beam line to use 63" beams with thick coping.

SAVINGS

\$ 347,193 - \$ 180,950 = \$ 166,243

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B3-4.1

PAGE NUMBER: 1 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253
PROJECT TITLE: SR 44 from Linger Longer Road to I-20,
 Greene County

PROPOSAL DESCRIPTION: MAINTAIN THE ORIGINAL DESIGN CONSTRUCTION CENTERLINE ON THE SR 44 BRIDGE OVER I-20, WIDEN THE BRIDGE SYMMETRICALLY, BUT REDUCE THE AMOUNT OF BRIDGE OVERLAY BY WARPING THE CENTER RAISED MEDIAN.

ORIGINAL DESIGN: The original design widens the existing SR 44 bridge over I-20 symmetrically to avoid a minimum vertical clearance issue if all the widening occurs on one side. The design shifts the PGL line from the existing PGL approximately 10-11 feet left and overlays the deck to obtain the desired cross slope.

PROPOSED CHANGE: It is proposed to maintain the original design plan layout and PGL location. However, reduce the extent of overlay to the portions of deck to the right of the raised median.

JUSTIFICATION: There was no indication that the overlay was required from a structural standpoint. The raised median runs the entire length of the bridge so limiting the overlay to the right of the median will not be noticed by the opposing traffic.

ADVANTAGES:

- Reduced construction cost
- Easier construction

DISADVANTAGES:

- Atypical median detailing

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 334,652		\$ 334,652
PROPOSED CHANGE:	\$ 110,472		\$ 110,472
SAVINGS:	\$ 224,180		\$ 224,180

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B3-4.1	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
519-0400 Concrete overlay, Portland Cement; variable thickness	3	SY	1,254	\$266.88	\$334,652
SUBTOTAL – COST TO PRIME					\$334,652
MARKUP					Incl.
TOTAL CONTRACT COST					\$334,652

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
519-0400 Concrete overlay, Portland Cement; variable thickness	3	SY	414	\$266.88	\$110,472
SUBTOTAL – COST TO PRIME					\$110,472
MARKUP					--
TOTAL CONTRACT COST					\$110,472

Difference [Original-Proposed] \$244,180

SOURCES

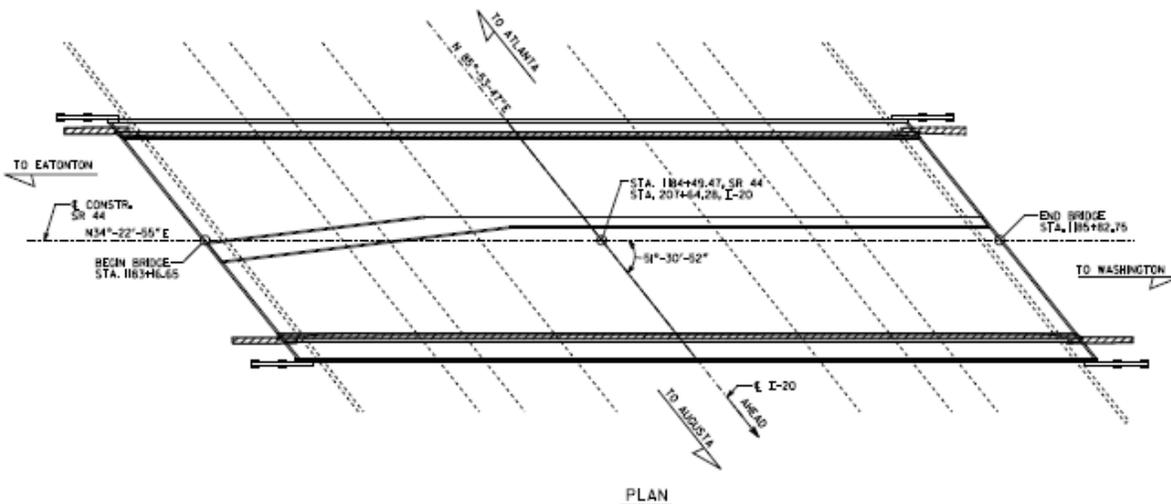
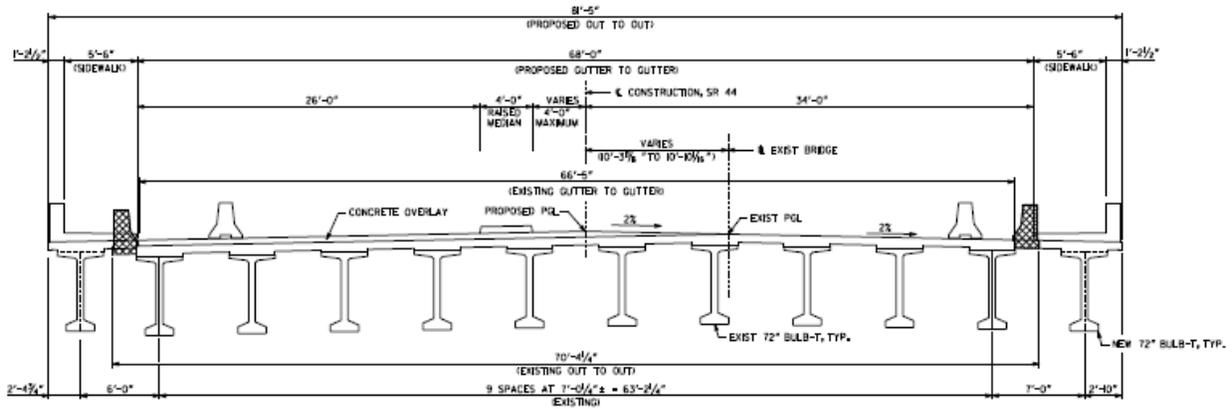
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B3-4.1

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

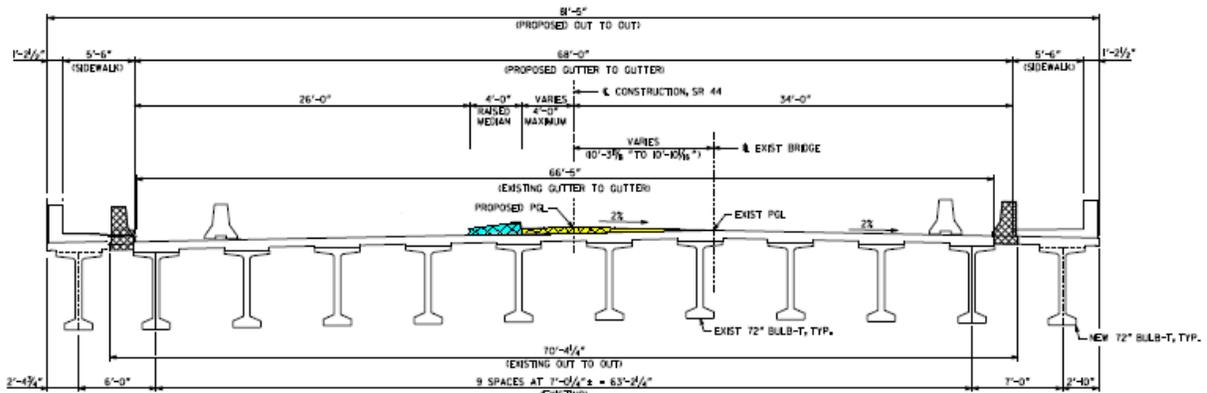


PROPOSED CHANGE SKETCH/DETAIL

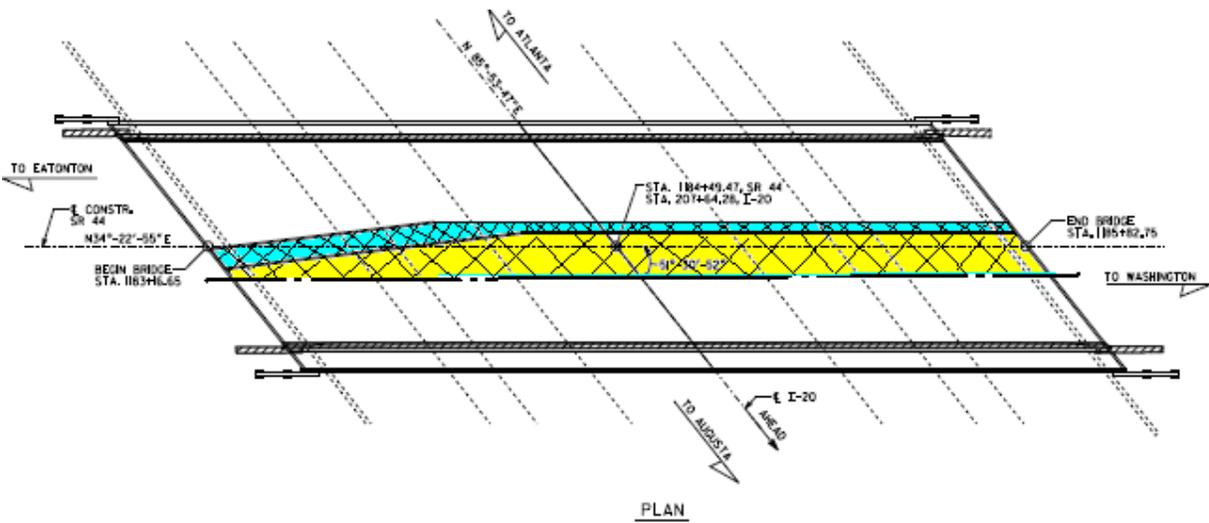
PROPOSAL NUMBER: B3-4.1

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253



- PROPOSED CHANGE OVERLAY
- PROPOSED CHANGE MEDIAN



CALCULATIONS

PROPOSAL NUMBER: B3-4.1

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Original Design

Overlay Limits

Width (ft)	Length (ft)	Area (SF)	Area (SY)
42.41	266.10	11285	1254

Width (see typical section) = $66.42 - 34 + 10 = 42.41$ ft

Cost

519-0400 Concrete overlay, Portland Cement, Variable Thickness = \$ 266.88 /SY

Cost = 1254 x \$ 266.88 = \$334,652

Proposed Change

Width (ft)	Length (ft)	Area (SF)	Area (SY)
14.00	266.10	3725	414

Width (see typical section) = $4 + 10 = 14.00$ ft

Increase in cost of raised median is negligible

Cost

519-0400 Concrete overlay, Portland Cement, Variable Thickness = \$ 266.88 /SY

Cost = 414 x \$ 266.88 = \$110,472

Savings = \$224,180

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-1	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION: FOR RURAL SECTIONS USE 11' LANE WIDTHS IN LIEU OF 12'.

ORIGINAL DESIGN: The current design of the rural typical roadway section includes two 12' travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on the rural sections from 12' to 11'.

JUSTIFICATION: The roadway is classified as "Rural Minor Arterial" and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 763,434		\$ 763,434
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 763,434		\$ 763,434

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R3-1	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	112680	\$5.65	\$636,642
Richland Creek Bridge (reduction)	1	SF	577.8	\$61.76	\$35,688
Little Creek Bridge (reduction)	1	SF	960	\$94.90	\$91,104
SUBTOTAL – COST TO PRIME					\$763,434
MARKUP					Incl.
TOTAL CONTRACT COST					\$763,434

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$763,434**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

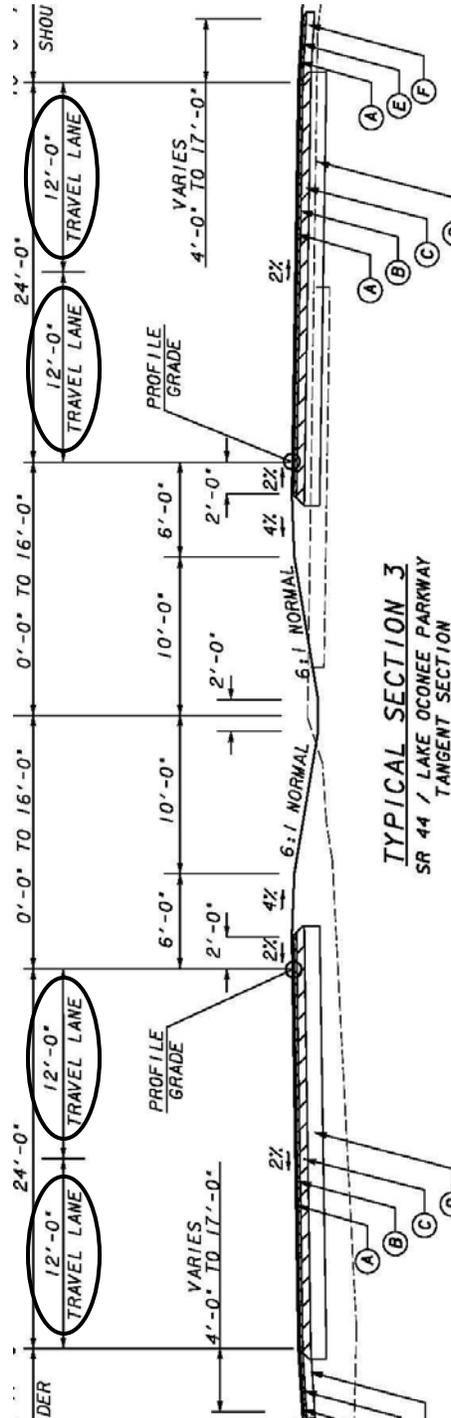
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

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



CALCULATIONS

PROPOSAL NUMBER: R3-1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF

440# Asph 19 MM = \$1.35/SF

660# Asph 25MM = \$2.04/SF

12" GAB (SY) = \$1.71/SF

Tack Coat = \$0.02/SF

Total \$5.65/SF = \$50.85/SY

Pavement Area Calcs.

Rural Section length = 40,192 LF total project – 11,494 LF urban sections – 528 LF bridges = 28,170 LF

28,170 LF x 1' width reduction/lane x 4 lanes = 112,680 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-1.1

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253
PROJECT TITLE: SR 44 from Linger Longer Road to I-20,
 Greene County

PROPOSAL DESCRIPTION: FOR RURAL SECTIONS USE 11' WIDE INSIDE LANE AND 12' OUTSIDE LANE.

ORIGINAL DESIGN: The current design of the rural typical roadway section includes two 12' travel lanes in each direction.

PROPOSED CHANGE: As an alternative to proposal R3-1, it is proposed to reduce the inside travel lanes on the rural sections from 12' to 11' while maintaining the 12' width on the outside lanes.

JUSTIFICATION: The roadway is classified as "Rural Minor Arterial" and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual. The 12' outside lanes would allow for easier vehicle movements at turn locations.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 381,717		\$ 381,717
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 381,717		\$ 381,717

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R3-1.1	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	56340	\$5.65	\$318,321
Richland Creek Bridge (reduction)	1	SF	288.9	\$61.76	\$17,844
Little Creek Bridge (reduction)	1	SF	480	\$94.90	\$45,552
SUBTOTAL – COST TO PRIME					\$381,717
MARKUP					Incl.
TOTAL CONTRACT COST					\$381,717

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$381,717**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

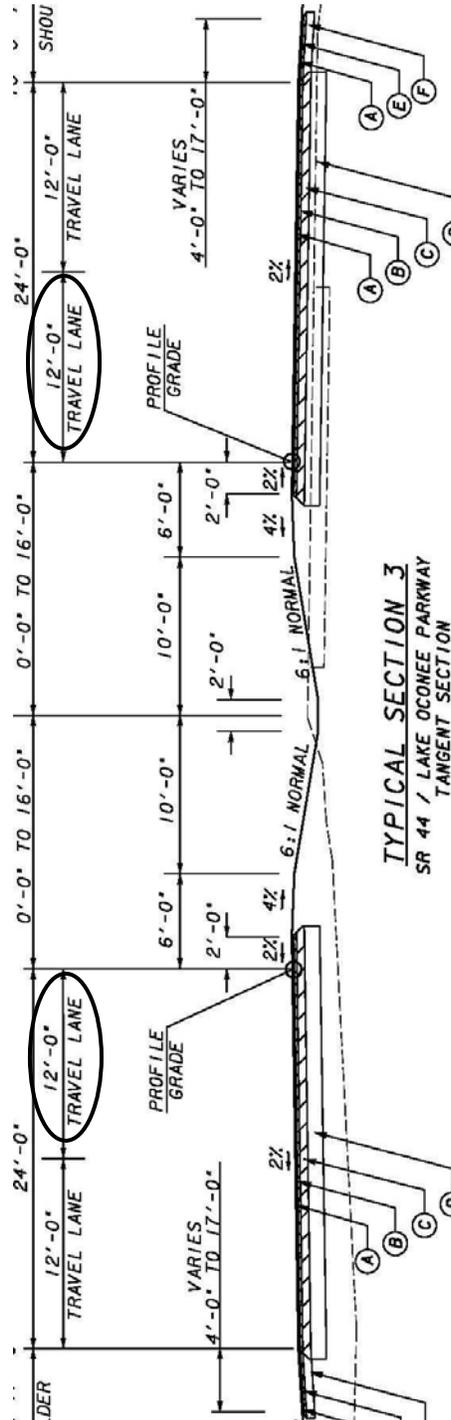
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-1.1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Proposed Change: Reduce inside travel lanes from 12'0" to 11'0"



CALCULATIONS

PROPOSAL NUMBER: R3-1.1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF

440# Asph 19 MM = \$1.35/SF

660# Asph 25MM = \$2.04/SF

12" GAB (SY) = \$1.71/SF

Tack Coat = \$0.02/SF

Total \$5.65/SF = \$50.85/SY

Pavement Area Calcs.

Rural Section length = 40,192 LF total project – 11,494 LF urban sections – 528 LF bridges = 28,170 LF

28,170 LF x 1' width reduction/lane x 2 lanes = 56,340 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-2	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION: FOR URBAN SECTIONS USE A 16' WIDE RAISED MEDIAN IN LIEU OF A 20' RAISED MEDIAN.

ORIGINAL DESIGN: Typical urban sections #1 and #2 from Sta 810+65 to Sta 899+86 and Sta 1166+04 to 1192+07 have a 20' raised median.

PROPOSED CHANGE: It is proposed to change the width of the raised median from 20 feet to 16 feet for typical section #1 and #2.

JUSTIFICATION: A 16' raised median is being used on other GDOT projects and AASHTO Chapter 7 (2004) allows a median width of 16' for Arterial roadways.

ADVANTAGES:

- Reduces project cost
- Less impact to adjacent property
- Allows use of minimum right of way in critical areas

DISADVANTAGES:

- Requires a Design Variance from GDOT

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 423,449		\$ 423,449
PROPOSED CHANGE:	\$ 390,377		\$ 390,377
SAVINGS:	\$ 33,072		\$ 33,072

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R3-2	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
206-0002 Borrow Excav	1	CY	109670	\$3.86	\$423,449
SUBTOTAL – COST TO PRIME					\$423,449
MARKUP					Incl.
TOTAL CONTRACT COST					\$423,449

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
206-0002 Borrow Excav	1	CY	101,134	\$3.86	\$390,377
SUBTOTAL – COST TO PRIME					\$390,377
MARKUP					Incl.
TOTAL CONTRACT COST					\$390,377

Difference [Original-Proposed] **\$33,072**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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) |
|---|--|

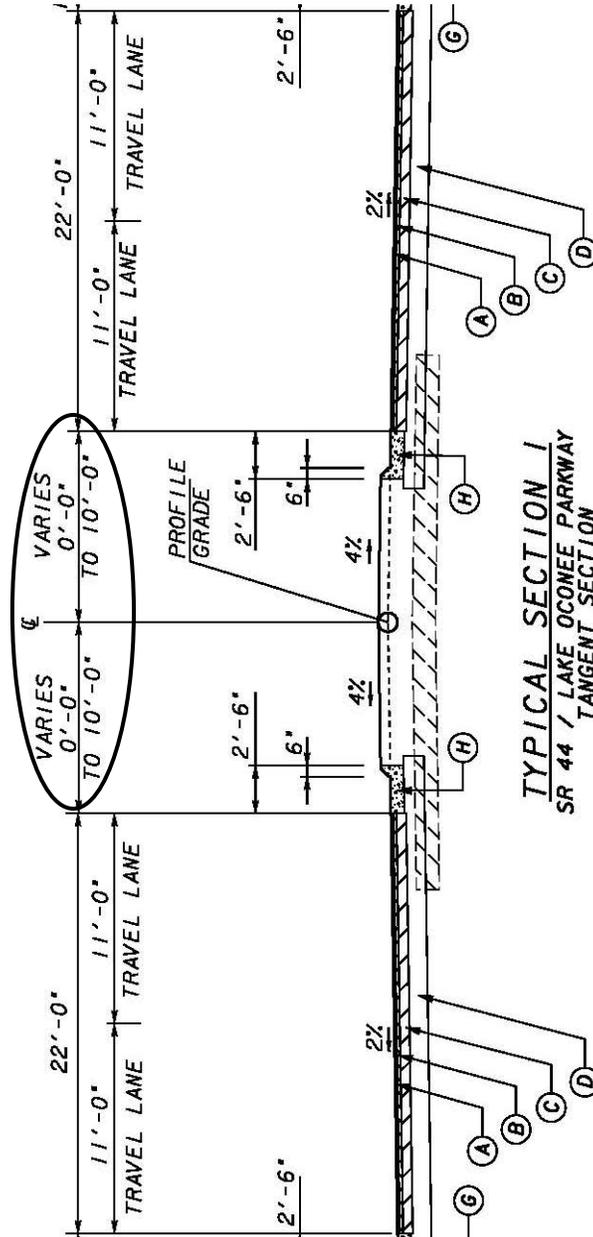
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-2

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

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



TYPICAL SECTION I
SR 44 / LAKE OCOREE PARKWAY
TANGENT SECTION

CALCULATIONS

PROPOSAL NUMBER: R3-2

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Typical Section #1 and #2 Sta 810+65 to Sta 899+86 and Sta 1166+04 to 1192+07 = 11,524 lf

- Footprint reduced by 4' by using 16' median in lieu of 20'
- Assume average height of fill at 5' based on review of project cross sections

$11,524 \text{ lf} \times 4' \text{ w} \times 5' \text{ h} = 230,480 \text{ cf} / 27 = 8,536 \text{ cy}$ less borrow material

- Item 206-0002 Borrow @ \$3.86/cy
 $8,536 \text{ cy} \times \$3.86 = \$32,949$ reduction in earth fill
 $109,670 \text{ cy} \text{ minus } 8,536 \text{ cy} = 101,134 \text{ cy}$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-4	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION: FOR SIDE STREET SECTIONS USE 11' MAXIMUM LANE WIDTHS IN LIEU OF 12' MAXIMUM.

ORIGINAL DESIGN: In the current design, the side street sections are shown as 12' maximum width travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on the side street sections from 12' maximum to 11' maximum.

JUSTIFICATION: Based on the current plans, the existing side streets appear to be less than 12' in lane width and GDOT design policy allows 11' lanes for local roads as indicated in Table 6.4 of the Design Policy Manual.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 7,571		\$ 7,571
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 7,571		\$ 7,571

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R3-4	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	1340	\$5.65	\$7,571
SUBTOTAL – COST TO PRIME					\$7,571
MARKUP					Incl.
TOTAL CONTRACT COST					\$7,571

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$7,571**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

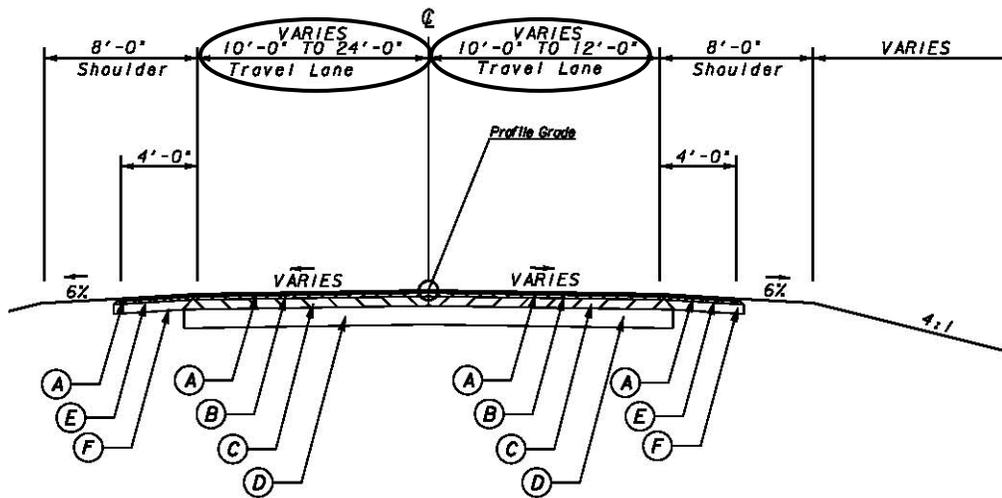
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-4

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Proposed Change: Revise 12'0" travel lanes to 11'0" max.



TYPICAL SECTION II

CAREY STATION ROAD
STA. 42+00.00 TO STA. 44+06.60

WRIGHTSVILLE CHURCH ROAD
STA. 70+00.00 TO STA. 71+50.00

CALCULATIONS

PROPOSAL NUMBER: R3-4

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF
440# Asph 19 MM = \$1.35/SF
660# Asph 25MM = \$2.04/SF
12" GAB (SY) = \$1.71/SF
Tack Coat = \$0.02/SF
Total \$5.65/SF = \$50.85/SY

Pavement Area Calcs.

Side streets with new 12' travel lanes proposed and their construction lengths are as follows:

Carey Station Road: 306'

Wrightsville Church Road: 364'

Total Length: 670 LF

670 LF x 1' width reduction/lane x 2 lanes = 1,340 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-5	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION:	ELIMINATE PAVED SHOULDERS ON RURAL SIDE STREET SECTIONS.
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ORIGINAL DESIGN: In the current design, the rural side street sections are shown with paved shoulders.

PROPOSED CHANGE: It is proposed to eliminate the paved shoulders on the rural side street sections.

JUSTIFICATION: Based on GDOT design policy, rural side streets do not require a paved shoulder.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for these side streets
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 11,149		\$ 11,149
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 11,149		\$ 11,149

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R3-5	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	5360	\$2.08	\$11,149
SUBTOTAL – COST TO PRIME					\$11,149
MARKUP					Incl.
TOTAL CONTRACT COST					\$11,149

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$11,149**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

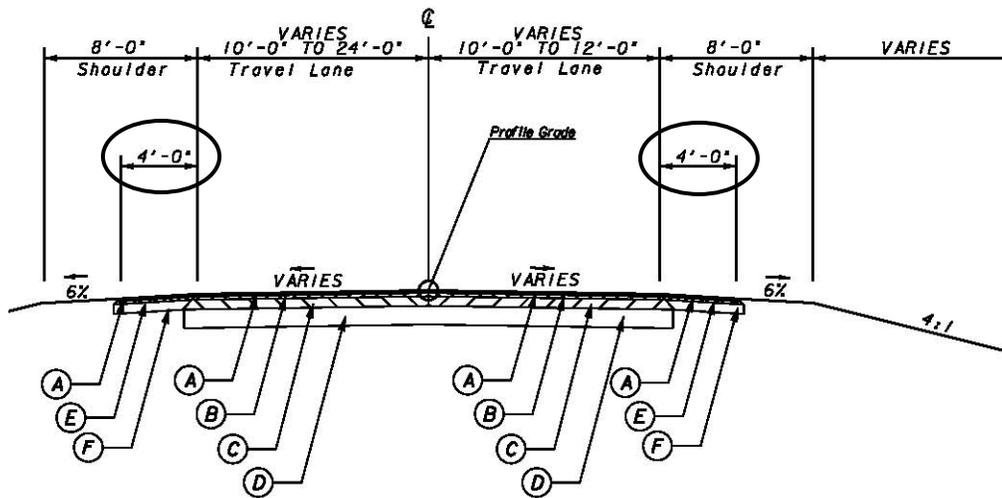
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-5

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Proposed Change: Eliminate paved shoulders



TYPICAL SECTION II

CAREY STATION ROAD
STA. 42+00.00 TO STA. 44+06.60

WRIGHTSVILLE CHURCH ROAD
STA. 70+00.00 TO STA. 71+50.00

CALCULATIONS

PROPOSAL NUMBER: R3-5

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Shoulder Pavement Cost Calculations

165# Asph 12.5 MM = \$0.53/SF

220# Asph 19 MM = \$0.68/SF

6" GAB (SY) = \$0.85/SF

Tack Coat = \$0.02/SF

Total \$2.08/SF = \$18.72/SY

Pavement Area Calcs.

Rural side streets with paved shoulders and their construction lengths and paved shoulder widths are as follows:

Carey Station Road: 306' x 4' wide

Wrightsville Church Road: 364' x 4' wide

Total Area:

670 LF x 4' width reduction/side x 2 sides = 5,360 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-7

PAGE NUMBER: 1 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253
PROJECT TITLE: SR 44 US 441 to Linger Longer Road,
 Greene County

PROPOSAL DESCRIPTION: REUSE AND OVERLAY EXISTING PAVEMENT FROM STA 900+00 TO STA 966+00, FROM STA 974+00 TO STA 982+00, FROM STA 1155+00 TO STA 1183+00, AND FROM STA 1186+00 TO STA 1191+00.

ORIGINAL DESIGN: In the current design, the pavement for SR44 is proposed to be replaced with full depth pavement construction for the entire project.

PROPOSED CHANGE: It is proposed to utilize the existing pavement in lieu of full depth pavement from Sta 900+00 to Sta 966+00, from Sta 974+00 to Sta 982+00, from Sta 1155+00 to Sta 1183+00, and from Sta 1186+00 to Sta 1191+00.

JUSTIFICATION: An existing pavement evaluation has not been completed, but based on photo evidence the existing pavement appears usable. The profile for SR44 can be revised to closer match the existing and will meet the required 55 mph design speed in the rural section, 45 mph design speed in the urban section and will meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Reduces pavement cost
- Improves stage construction

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 860,160		\$ 860,160
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 860,160		\$ 860,160

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R3-7	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SF	168000	\$5.12	\$860,160
SUBTOTAL – COST TO PRIME					\$860,160
MARKUP					Incl.
TOTAL CONTRACT COST					\$860,160

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] \$860,160

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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. Attached Calculation Sheet |
|---|---|

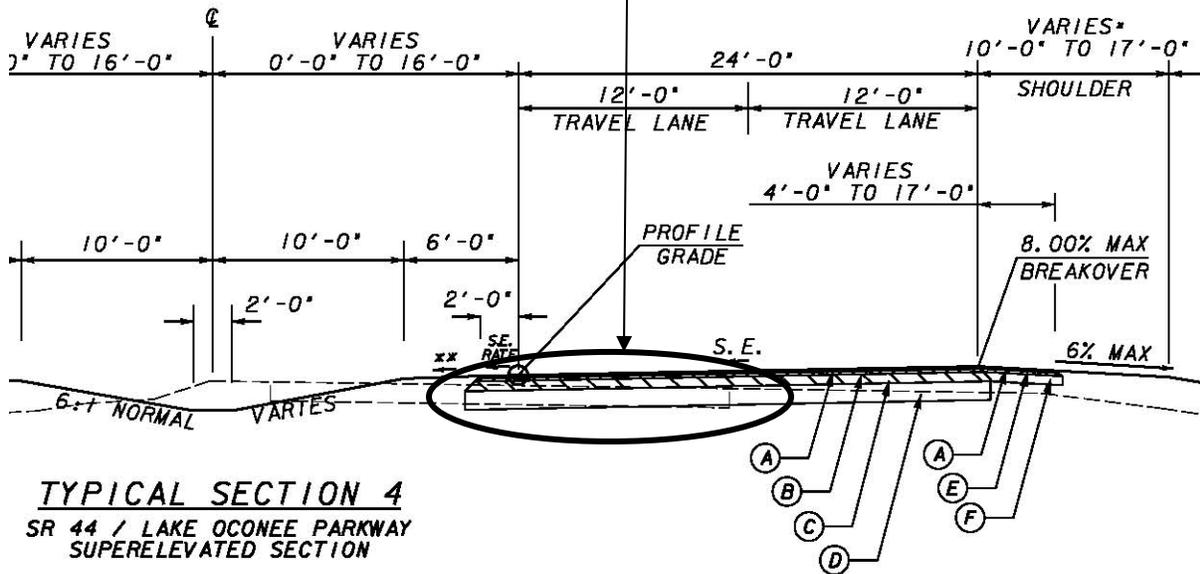
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R3-7

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Proposed Change: Overlay where possible in lieu of full pavement section



CALCULATIONS

PROPOSAL NUMBER: R3-7

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Pavement Cost Calculations

Full pavement section less overlay layer:

440# Asph 19 MM = \$1.35/SF

660# Asph 25MM = \$2.04/SF

12" GAB (SY) = \$1.71/SF

Tack Coat = \$0.02/SF

Total \$5.12/SF

Pavement Area Calcs.

Sta 900+00 to Sta 966+00 and from Sta 974+00 to Sta 982+00

Total Length = 7400 LF

Assumed width = 12 ft

7400 LF x 12 ft = 88800 SF

88800 * \$5.12 = \$454,656

Sta 1155+00 to Sta 1183+00 from Sta 1186+00 to Sta 1191+00

Total Length = 3300 LF

Assumed width = 24 ft

3300 LF x 24 ft = 79200 SF

79200 * \$5.12 = \$405,504

Total SF = 168,000

Total Cost Savings = \$860,160

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-8	PAGE NUMBER: 1 of 13
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION: REVISE SR44 HORIZONTAL ALIGNMENT FROM APPROXIMATE STA 1075+00 TO APPROXIMATE STA 1145+00 TO CLOSER MATCH EXISTING ALIGNMENT AND AVOID A DISPLACEMENT ON PARCEL 34 AT STA 1135+00.

ORIGINAL DESIGN: In the current design, the alignment of SR44 is shifted away from the existing alignment between approximate Sta 1075+00 to approximate Sta 1145+00. Existing curves have been replaced with a tangent section. The existing small lake located left of Sta 1093+00 is impacted and lake restoration is required. Also, a house on Parcel 34 is within the limits of construction.

PROPOSED CHANGE: It is proposed to shift the horizontal alignment of SR44 to more closely follow the existing curved alignment and avoid impact to the lake located at Sta 1093+00 and avoid taking the house on Parcel 34 at Sta 1135+00.

JUSTIFICATION: The alignment of SR44 can be revised to closer match the existing and will meet the required 55 mph speed design in the rural section and will meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Avoids a lake restoration
- Reduces right of way impacts
- Reduces right of way cost

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 5,420,000		\$ 5,420,000
PROPOSED CHANGE:	\$ 4,294,520		\$ 4,294,520
SAVINGS:	\$ 1,125,480		\$ 1,125,480

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R3-8	PAGE NUMBER:	2 of 13
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	1				\$5,370,000
Restoration of Lake Sta 1092+50 Lt	1	Lump	1	\$50,000	\$50,000
SUBTOTAL – COST TO PRIME					\$5,420,000
MARKUP					--
TOTAL CONTRACT COST					\$5,420,000

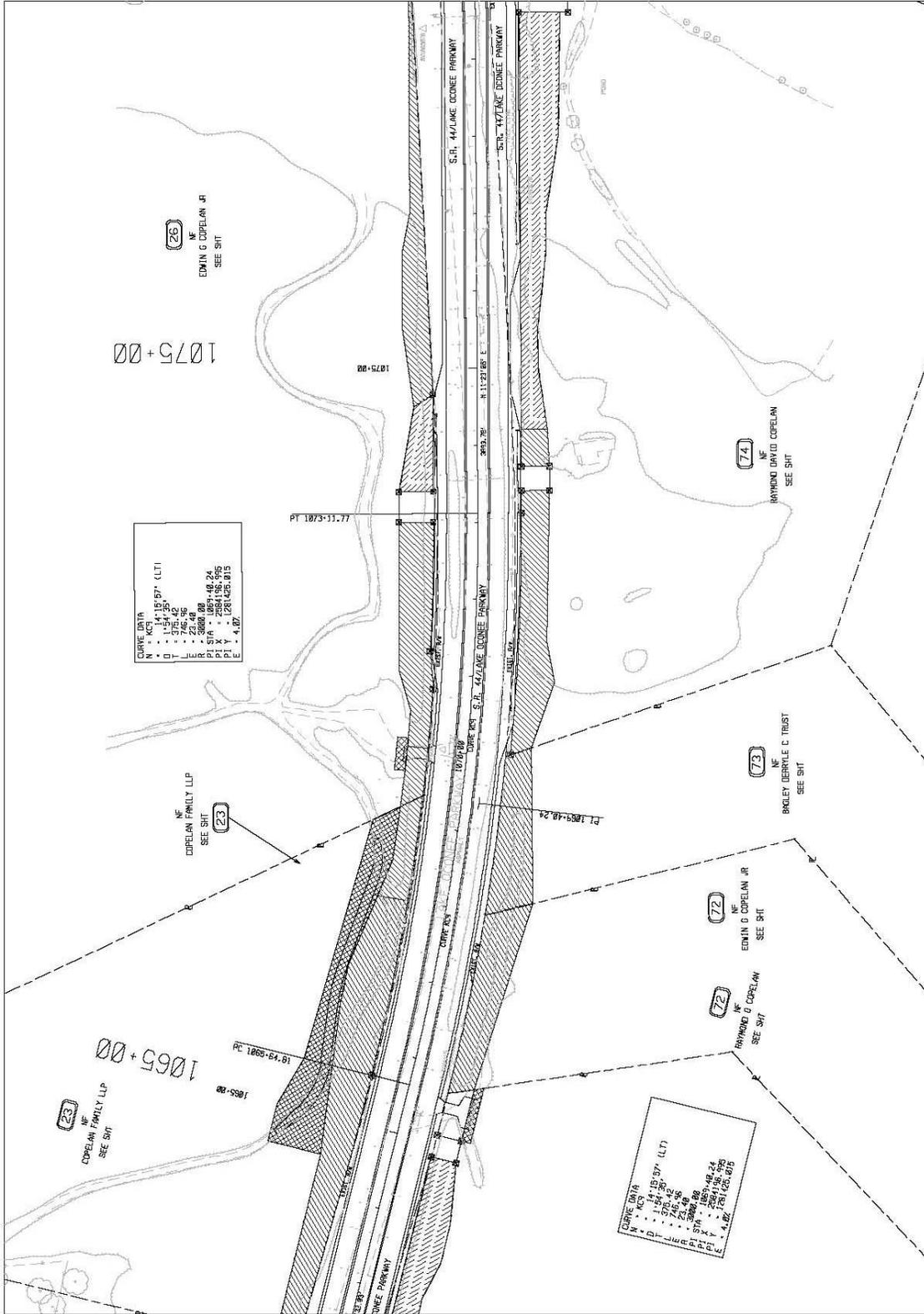
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	7				\$4,519,000
Restoration of Lake Sta 1092+50 Lt	1	Lump	0	\$0	\$0
205-0001 Unclass Excav (Reduction)	1	CY	-5926	\$2.99	-\$17,718
206-0002 Borrow Excav(Reduction)	1	CY	-50185	\$4.12	-\$206,762
SUBTOTAL – COST TO PRIME					\$4,294,520
MARKUP					--
TOTAL CONTRACT COST					\$4,294,520

Difference [Original-Proposed] **\$1,125,480**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (Revised ROW Cost Estimate Summary) |
|---|--|

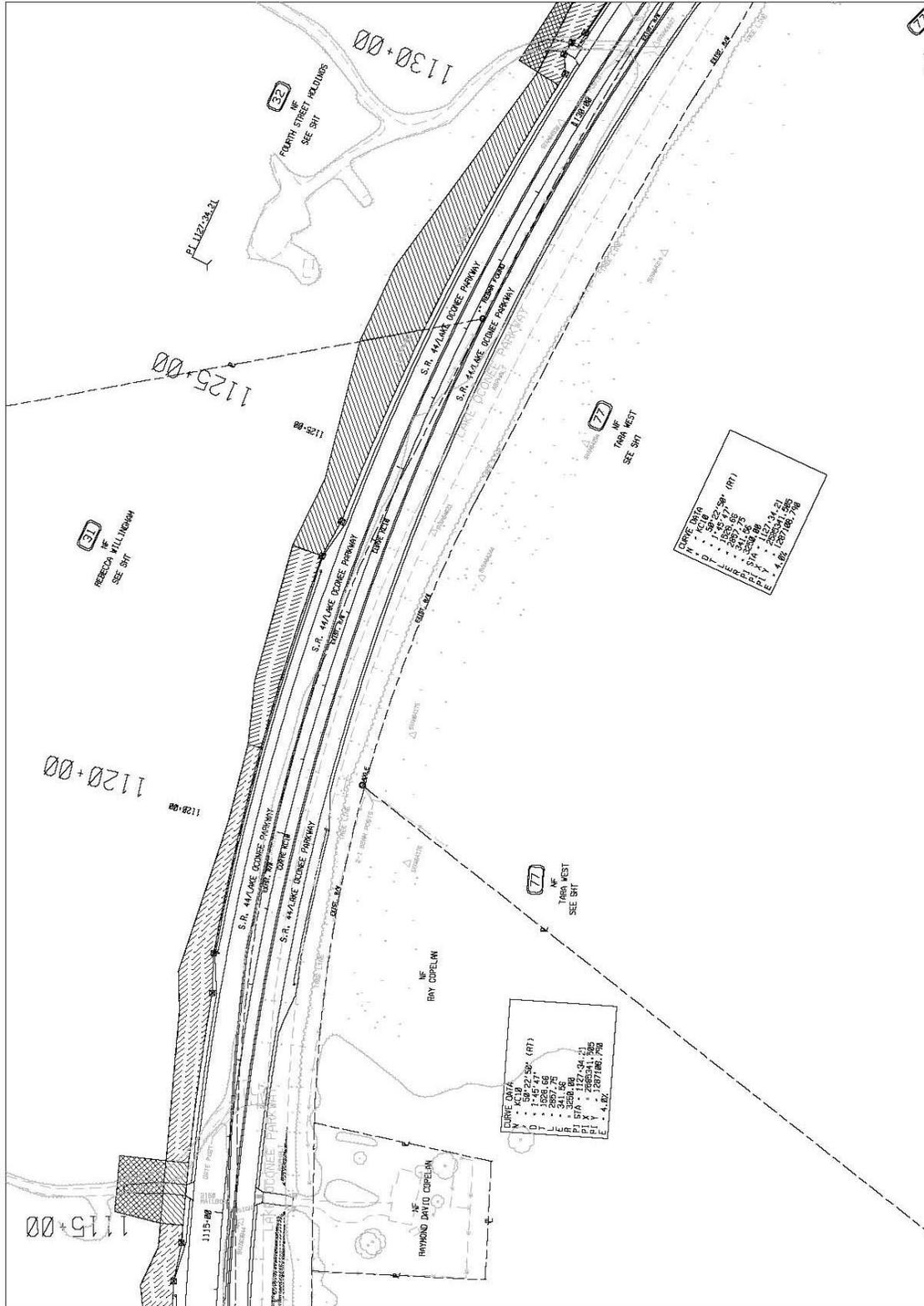


CURVE DATA

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D	•	1154.55	•		•	
L	•	7.25	•	56	•	
E	•	23.48	•		•	
PI	•	1069.48.24	•		•	
PT	•	1069.48.24	•		•	
PT X	•	2584138.399	•		•	
PT Y	•	1281425.015	•		•	
E	•	4.07	•		•	

CURVE DATA

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L	•	7.25	•	56	•	
E	•	23.48	•		•	
PI	•	1069.48.24	•		•	
PT	•	1069.48.24	•		•	
PT X	•	2584138.399	•		•	
PT Y	•	1281425.015	•		•	
E	•	4.07	•		•	



31 REBECCA WILLINGHAM
NF
SEE SHI

32 POPPY STREET HOLDINGS
NF
SEE SHI

77 TRAP WEST
NF
SEE SHI

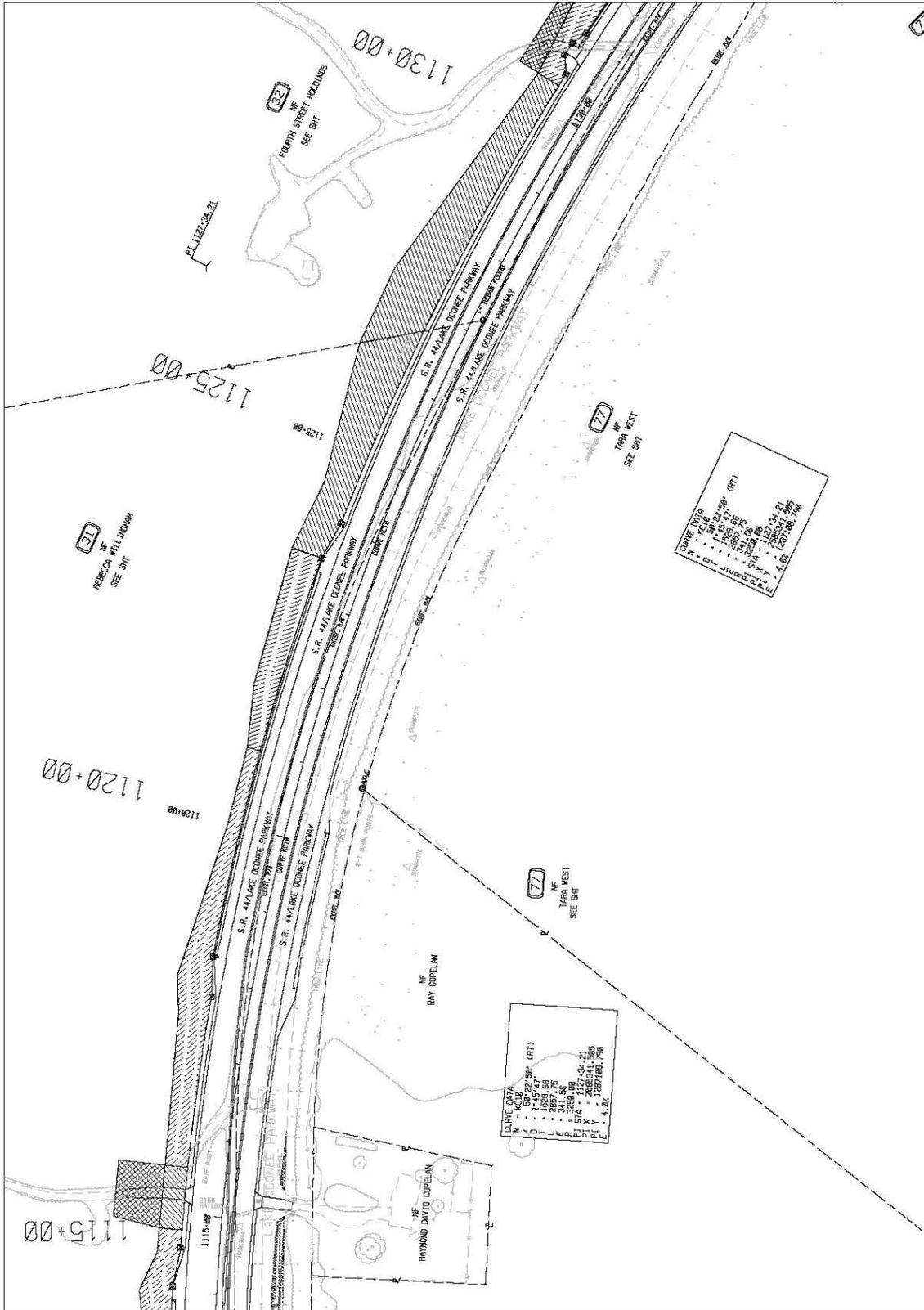
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SEE SHI

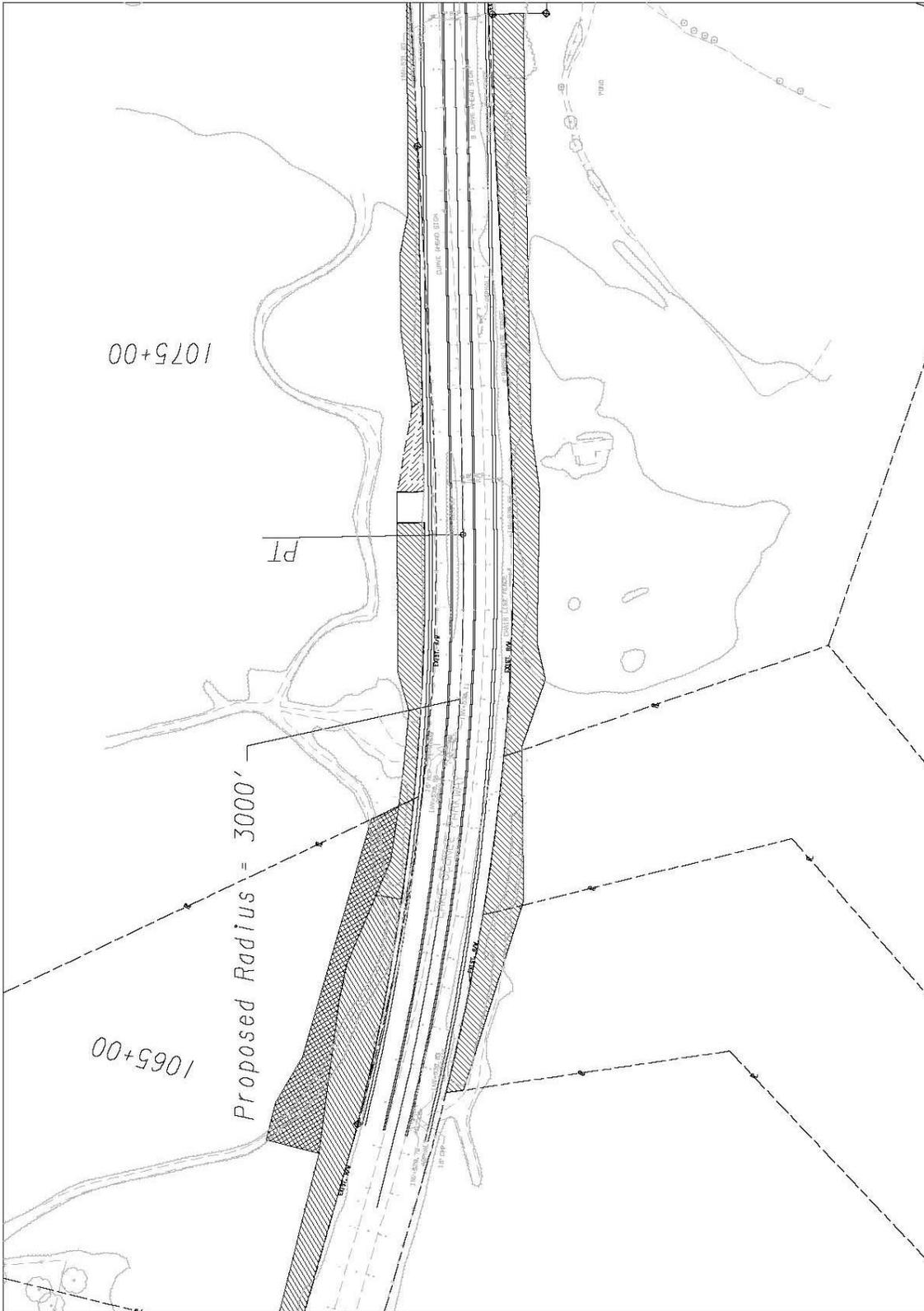
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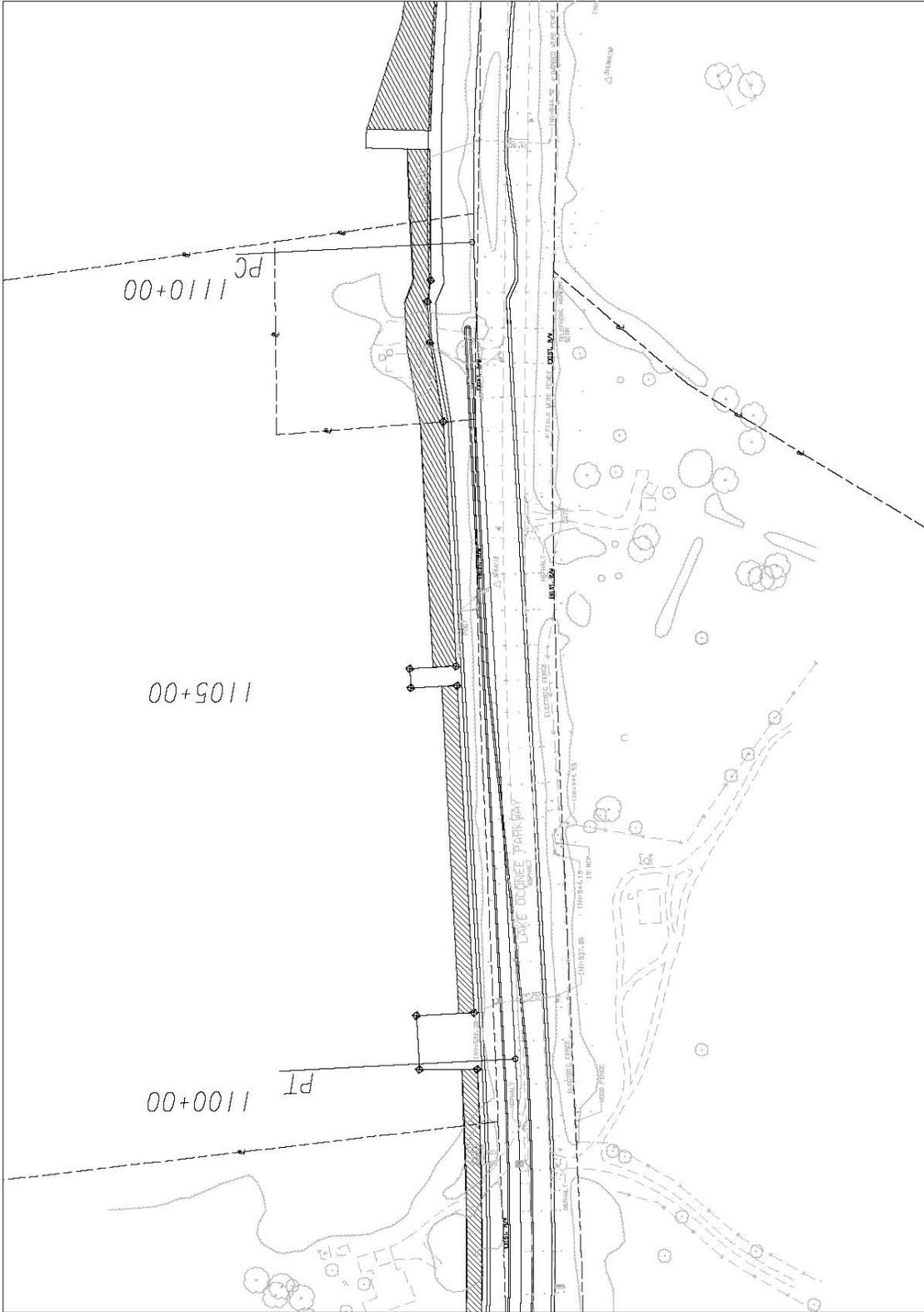
X	58°22'50"
Y	15°45'47"
D	2867.75
L	3241.56
PI STA	1127+04.21
PI Y	288541.265
E	4.82

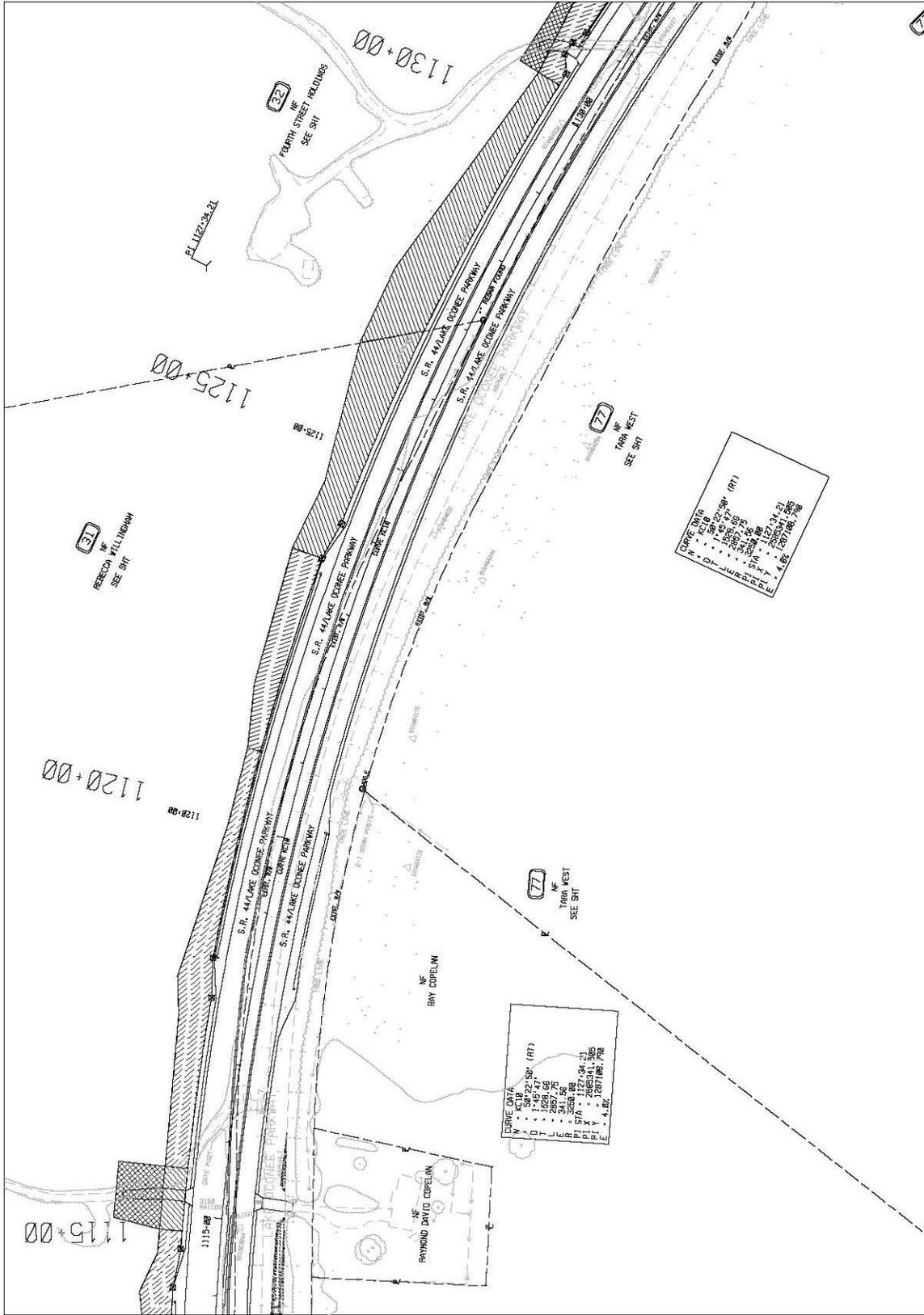
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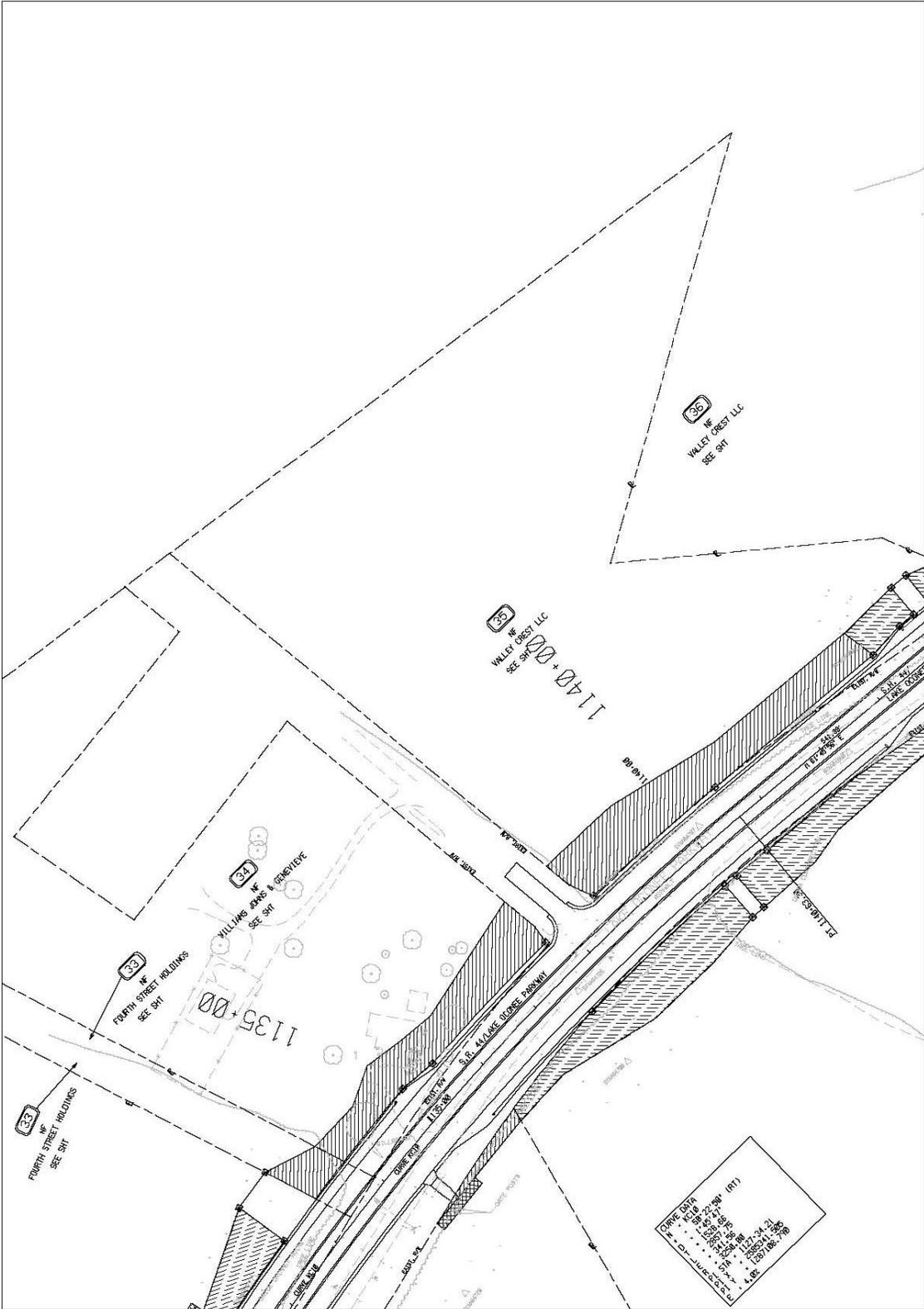
X	58°22'50"
Y	15°45'47"
D	2867.75
L	3241.56
PI STA	1127+04.21
PI Y	288541.265
E	4.82











CALCULATIONS

PROPOSAL NUMBER: R3-8

PAGE NUMBER: 13 of 13

PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Assumed roadway paving quantities remain unchanged.

Original ROW cost estimate dated 8/7/12 = \$5,370,000

Measured right of way area reduction = 4.93 Ac

Measured easement reduction = 0.66 Ac

Revised ROW cost estimate = \$4,519,000 using GDOT ROW spreadsheet (see copy below)

Earthwork:

Measured CADD volumes = 50185 CY reduction in Borrow Excav

Measured CADD volumes = 5926 CY reduction in Unclass Excav

Date: Project: CSSTP-0006-00(253)
 Revised: REV for VE R3-8 County:
 Description: SR44 Widening PI:
 Project Termini:

Parcels: 50 Existing ROW:
 Required ROW:

Land and Improvements _____ \$3,320,430.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$50,000.00
Improvements	\$400,000.00

Valuation Services _____ \$165,625.00

Legal Services _____ \$333,750.00

Relocation _____ \$185,000.00

Demolition _____ \$91,500.00

Administrative _____ \$422,500.00

TOTAL ESTIMATED COSTS _____ \$4,518,805.00

TOTAL ESTIMATED COSTS (ROUNDED) _____ \$4,519,000.00

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R3-9	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0006-00(253) / 0006253
PROJECT TITLE:	SR 44 from Linger Longer Road to I-20, Greene County

PROPOSAL DESCRIPTION: REVISE HORIZONTAL ALIGNMENT FROM APPROXIMATE STA 830+00 TO APPROXIMATE STA 845+00 TO CLOSER MATCH EXISTING ALIGNMENT AND AVOID THE RIGHT OF WAY DISPLACEMENT OF PARCEL 55 IN THE SOUTHEAST CORNER OF THE INTERSECTION OF SR44 AND LAKE COUNTY DRIVE.

ORIGINAL DESIGN: In the current design, the alignment of SR44 is shifted to the East as it approaches the intersection with Lake County Drive, and the alignment and associated fill create the need for a structure displacement on Parcel 55.

PROPOSED CHANGE: It is proposed to shift the horizontal alignment of SR44 to more closely follow the existing alignment and avoid the displacement of Parcel 55.

JUSTIFICATION: The alignment of SR44 can be revised to closer match the existing and will meet the required 45mph speed design in the urban section and will meet the requirements of GDOT and AASHTO.

ADVANTAGES:

- Avoids a right of way displacement
- Reduces right of way cost

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 5,370,000		\$ 5,370,000
PROPOSED CHANGE:	\$ 5,120,000		\$ 5,120,000
SAVINGS:	\$ 250,000		\$ 250,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R3-9	PAGE NUMBER: 2 of 5
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PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	1				\$5,370,000
SUBTOTAL – COST TO PRIME					\$5,370,000
MARKUP					--
TOTAL CONTRACT COST					\$5,370,000

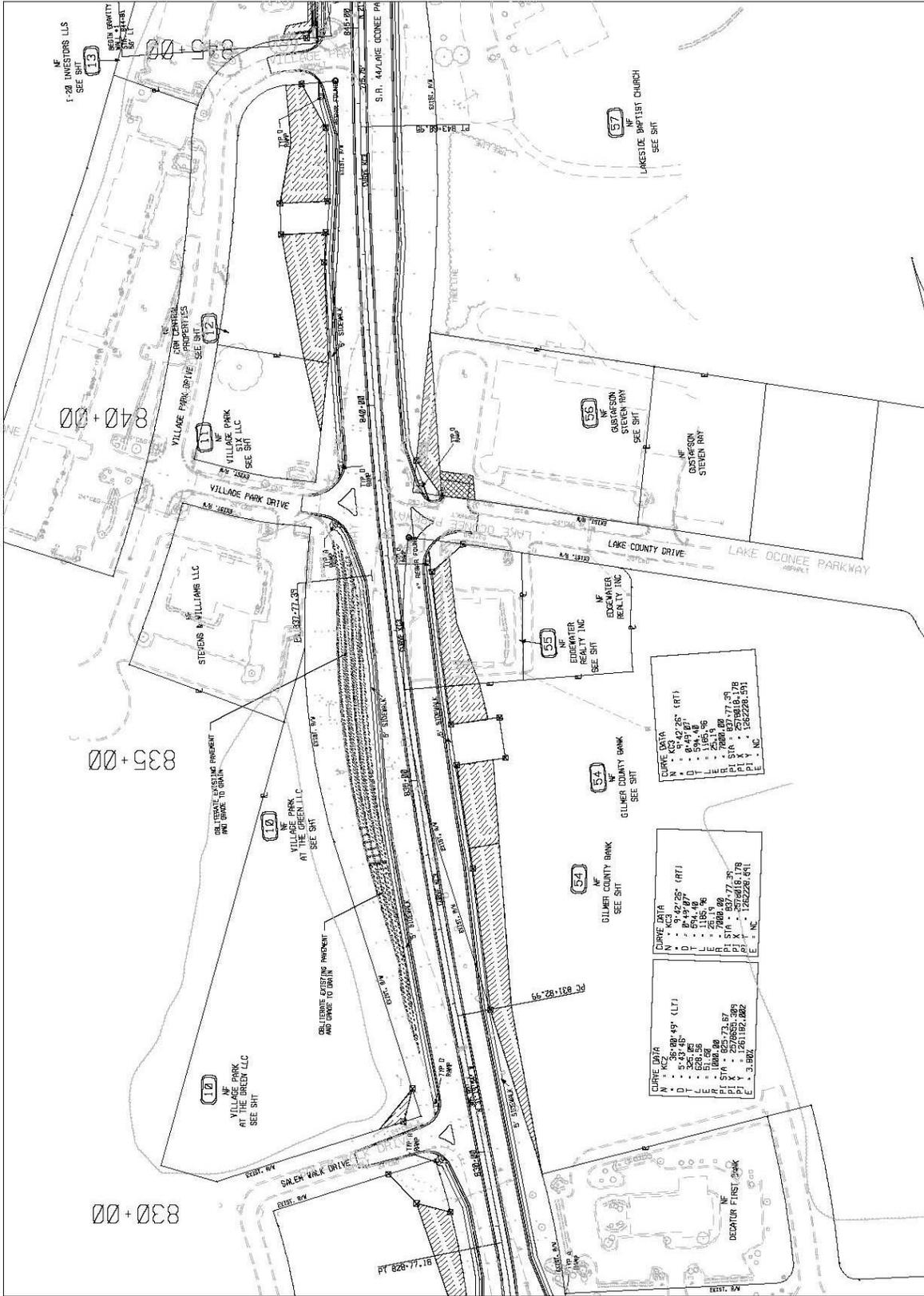
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of Way	7				\$5,120,000
SUBTOTAL – COST TO PRIME					\$5,120,000
MARKUP					--
TOTAL CONTRACT COST					\$5,120,000

Difference [Original-Proposed] **\$250,000**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC 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 (Revised ROW Cost Estimate Summary) |
|---|--|



R3-9 Original Design
3 of 5

CALCULATIONS

PROPOSAL NUMBER: R3-9	PAGE NUMBER: 5 of 5
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PROJECT #/PI #: CSSTP-0006-00(253) / 0006253

Assumed roadway quantities remain unchanged.

Original ROW cost estimate dated 8/7/12 = \$5,370,000
 Revised ROW cost estimate = \$5,120,000 using GDOT format (See summary page below of GDOT spreadsheet revised to eliminate one (1) commercial displacement and reduce the cost for improvements by an estimated \$100,000)

GEORGIA DEPARTMENT OF TRANSPORTATION PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: Project: CSSTP-0006-00(253)	County:
Revised: FOR VE R3-9	PI:
Description: SR44 Widening	
Project Termini:	

Parcels: 50	Existing ROW:
	Required ROW:

Land and Improvements _____ \$3,906,510.00

<i>Proximity Damage</i> \$0.00
<i>Consequential Damage</i> \$0.00
<i>Cost to Cures</i> \$0.00
<i>Trade Fixtures</i> \$50,000.00
<i>Improvements</i> \$500,000.00

Valuation Services _____ \$165,625.00

Legal Services _____ \$333,750.00

Relocation _____ \$210,000.00

Demolition _____ \$81,500.00

Administrative _____ \$422,500.00

TOTAL ESTIMATED COSTS _____ **\$5,119,885.00**

TOTAL ESTIMATED COSTS (ROUNDED) _____ **\$5,120,000.00**

VALUE ENGINEERING STUDY

FUNCTION ANALYSIS

The following functions for the S.R. 44 from US 441 to I-20 road widening projects 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 V.E. team in becoming familiar with the needs and long-term goals for the project. The Basic Function of the project is to “Increase Capacity”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

Verb	Noun		Verb	Noun
Relieve	Congestion		Retain	Earth
Support	Commerce		Re-establish	Vegetation
Support	Recreation		Clear	Trees
Maintain	Access		Support	Vehicles
Improve	Operations		Separate	Traffic
Span	Water		Control	Erosion
Span	Roadway		Control	Traffic
Bypass	Business District		Support	Roadway
Facilitate	Bikes		Maintain	Sight Distance
Facilitate	Pedestrians		Protect	Lake
Carry	Water		Inform	Traveler
Convey	Water		Protect	User
Facilitate	Vehicle Movement		Preserve	Property

VALUE ENGINEERING STUDY

COST MODEL/DISTRIBUTION

**SR 44 from US 441 to Linger Longer Road (PI #0006252)
Greene/Putnam County, Georgia**

ITEM	COST \$	% OF TOTAL
ASPHALT CONCRETE PAVING	16,079,630	32.08%
RIGHT-OF-WAY	10,055,868	20.06%
AGGREGATE BASE COURSE	5,173,107	10.32%
EARTHWORK	4,096,393	8.17%
BRIDGES/STRUCTURES	3,247,600	6.48%
CLEARING AND GRUBBING	2,700,000	5.39%
DRAINAGE SYSTEM	2,121,128	4.23%
TRAFFIC CONTROL	1,800,000	3.59%
GRASSING/EROSION CONTROL	1,687,251	3.37%
CURB & GUTTER	1,035,805	2.07%
CONCRETE SLABS/APRONS/MEDIANS	1,002,048	2.00%
SIDEWALKS	330,664	0.66%
SIGNALS	328,117	0.65%
SIGNAGE/MARKING	282,417	0.56%
GUARDRAILS	123,118	0.25%
DEMOLITION	62,116	0.12%
RETAINING WALLS	0	0.00%
*TOTAL - PROJECT	50,125,262	100.00%
*Does not include Engrg & Inspection, Fuel Adjustment or Liquid AC Adjustment		

VALUE ENGINEERING STUDY

COST MODEL/DISTRIBUTION

**SR 44 from Linger Longer Road to I-20 (PI #0006253)
Greene County, Georgia**

ITEM	COST \$	% OF TOTAL
ASPHALT CONCRETE PAVING	10,299,294	23.22%
RIGHT-OF-WAY	9,616,602	21.68%
AGGREGATE BASE COURSE	4,798,176	10.82%
GRASSING/EROSION CONTROL	4,772,625	10.76%
CONCRETE SLABS/APRONS/MEDIANS	3,389,778	7.64%
CLEARING AND GRUBBING	3,000,000	6.76%
BRIDGES/STRUCTURES	1,794,000	4.04%
DRAINAGE SYSTEM	1,536,940	3.46%
EARTHWORK	1,342,532	3.03%
TRAFFIC CONTROL	1,000,000	2.25%
CURB & GUTTER	910,195	2.05%
SIGNALS	656,228	1.48%
GUARDRAILS	368,972	0.83%
SIGNAGE/MARKING	295,816	0.67%
SIDEWALKS	181,753	0.41%
DEMOLITION	150,000	0.34%
SIDE BARRIERS	143,133	0.32%
RETAINING WALLS	55,703	0.13%
LAKE RESTORATION	50,000	0.11%
*TOTAL - PROJECT	44,361,747	100.00%
*Does not include Engrg & Inspection, Fuel Adjustment or Liquid AC Adjustment		

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 44 FROM US 441 TO LINGER LONGER ROAD
PROJECT #/PI # CSSTP-0006-00(252) / 0006252
PROJECT LOCATION: GREENE/PUTNAM COUNTY, GEORGIA

NO.	IDEA	RANK
	ROADWAY (R)	
R2-1	For Rural Sections Use 11' Lane Widths in lieu of 12'	4
R2-1.1	For Rural Sections Use 11' Wide Inside Lane and 12' Outside Lane	4
R2-2	For Urban Sections Use 16' Raised Median Width in lieu of 20'	4
R2-3	For Urban Sections Incorporate Multi-use Trail to Allow Bike Traffic	Cmmt
R2-4	For 2-lane Side Street Sections Use 11' Wide Lanes in lieu of 12'	4
R2-5	Eliminate 2' Paved Shoulder on 2-lane Side Streets	4
R2-6	Overlay Side Streets at Tie-ins	w/ 2-7
R2-7	Reuse and Overlay Existing Pavement from Approximate Sta 332+00 to Approximate Sta 359+00 and from Approximate Sta 485+00 to Approximate Sta 734+00	5
R2-8	Reduce Shoulder Width on Rural Side Streets from 10' to 8'	4
R2-9	Reduce Shoulder Width on Urban Side Streets from 12' to 10'	4
R2-10	Reduce Right-of-Way from 200' to 140' and Use Remaining as Permanent Easement at Multiple Locations	5
R2-11	Revise the Vertical Profile from Sta 115+00 to Sta 234+00 to Reduce the Volume of Earthwork	5
R2-12	Revise Horizontal Alignment from Approximate Sta 393+00 to Approximate Sta 490+00 to Closer Match Existing Alignment	4
R2-13	Revise Tie-in of Existing SR 44 to New Alignment to Avoid Displacement	3
R2-14	Revise Tie-in of Tanyard Road and New Phoenix Road to Reduce Property and Pond Impacts	3
R2-15	From Sta 265+00 to 320+00 Shift Horizontal Alignment Closer to Existing Alignment	3
R2-16	Revise the Vertical Profile from Sta 297+00 to Sta 370+00 to Reduce the Volume of Earthwork	4

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 44 FROM US 441 TO LINGER LONGER ROAD
PROJECT #/PI # CSSTP-0006-00(252) / 0006252
PROJECT LOCATION: GREENE/PUTNAM COUNTY, GEORGIA

NO.	IDEA	RANK
	BRIDGE (B)	
B2-1	Lower Profile of SR 44 over Rooty Creek by Approximately 3 feet	w/ 2-11
B2-2	Lower Profile of SR 44 over Crooked Creek by Approximately 2.5 feet	w/ 2-16
B2-3	At Crooked Creek, Use 72” Bulb Tees at Wider Spacing in lieu of 63” Bulb Tees	Drop
B2-4	Extend Triple Culvert at Crooked Creek and Build 1 Bridge Downstream	3
B2-5	At Lick Creek, Build Parallel Prestressed Beam Bridge Without Connecting to Existing Bridge	5
B2-6	Eliminate the Overlay on the Existing Bridge for SR 44 Over Lick Creek.	4
B2-7	Build Parallel Prestressed Beam Bridge Instead of Widening “in kind” the Existing Steel Plate Girder Bridge at SR 44 over Oconee River	5
B2-8	At Oconee River, Eliminate Overlay of Existing Bridge Deck	4
B2-9	Reduce Length of Gravity Retaining Walls	3
B2-10	Reduce Lane/Bridge Widths on Rooty Creek and Crooked Creek	w/ R2-1
B2-11	Use Precast Pipes and Boxes in lieu of Cast in Place Culvert	3

The rankings indicated as “Drop” were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 44 FROM LINGER LONGER ROAD TO I-20
PROJECT #/PI # CSSTP-0006-00(253) / 0006253
PROJECT LOCATION: GREENE COUNTY, GEORGIA

NO.	IDEA	RANK
	ROADWAY (R)	
R3-1	For Rural Sections Use 11' Lane Widths in lieu of 12'	4
R3-1.1	For Rural Sections Use 11' Wide Inside Lane and 12' Outside Lane	4
R3-2	For Urban Sections Use 16' Median Width in lieu of 20'	4
R3-3	For Urban Sections Incorporate Multi-use Trail to Allow Bike Traffic	Cmmt
R3-4	For 2-lane Side Street Sections Use 11' Maximum Width Lanes in lieu of 12' Maximum	4
R3-5	Eliminate Paved Shoulder on Side Streets	4
R3-6	Use 6' Wide Shoulder in lieu of 4' for Rural Sections to Allow for Bike Lane	Cmmt
R3-7	Reuse and Overlay Existing Pavement from Sta 900+00 to 966+00, Sta 974+00 to 982+00, Sta 1155+00 to 1183+00, and Sta 1186+00 to 1191+00	5
R3-8	Revise Horizontal Alignment from Sta 1075+00 to Sta 1145+00 Closer to Existing	4
R3-9	Revise Horizontal Alignment from Sta 830+00 to Sta 845+00 to Closer Match Existing Alignment	4
R3-10	Revise Horizontal Alignment at Sta 1130+00 to 1145+00 to Avoid Property Displacement	w/ 3-8
R3-11	Revise Rural Typical Section to Show 4' Maximum Shoulder in lieu of 4' to 17'	Cmmt
R3-12	Use Same Pavement Section as Project #252	Cmmt

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 44 FROM LINGER LONGER ROAD TO I-20
PROJECT #/PI # CSSTP-0006-00(253) / 0006253
PROJECT LOCATION: GREENE COUNTY, GEORGIA

NO.	IDEA	RANK
	BRIDGE (B)	
B3-1	On Richland Creek Reduce Lane Width from 12' to 11'	w/ R3-1
B3-2	On Little Creek Maintain Downstream Culvert and Build 1 New Bridge Upstream	Drop
B3-2.1	On Little Creek Lower New Bridges by 1.5'	1
B3-3	On Little Creek reduce Lane Widths from 12' to 11'	w/ R3-1
B3-4	On I-20 Bridge Maintain Existing Bridge Baseline, Eliminate Overlay and Widen to Only One Side	4
B3-4.1	Maintain the Original Design Construction Centerline on the SR 44 bridge over I-20, Widen the Bridge Symmetrically, but Reduce the Amount of Bridge Overlay by Warping the Center Raised Median.	4
B3-4.2	Construct Pedestrian Bridge in lieu of Adding Sidewalk to Existing Bridge	2
B3-5	On I-20 Bridge use 63" Bulb Tees and Eliminate Jacking of Bridge	3

The rankings indicated as "Drop" were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

VALUE ENGINEERING WORKSHOP AGENDA
For
GEORGIA DEPARTMENT OF TRANSPORTATION

Project #'s: CSSTP-0006-00(253) & (253) - PI#: 0006252 & 0006253
SR 44 from US 441 to I-20

28 HOUR - V.E. STUDY
3-6 December 2012

The value engineering workshop for the subject project will be conducted for 3-1/2 days from 3-6 December 2012, **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 V.E. Team Leader coordinates logistics with GDOT, and confirms project objectives and any unique requests, and develops a cost model for the project. The V.E. Team receives and reviews all project documents.

MONDAY
0800 - 0900

V.E. Team Introduction Phase

Tom Orr, P.E., CVS
Team Leader, U.S. Cost, Inc.
(V.E. 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 V.E. 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 V.E. Team Leader will provide cost models, and cost bar graphs to help the team identify the high-cost features of the project.

0900 - 1100

Project Design Briefing

V.E. 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 V.E. 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)

1100 - 1200 **Function Analysis Phase** V.E. Team

The V.E. team will discuss the required functions 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** V.E. Team

The V.E. 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** V.E. 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** V.E. 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

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

WEDNESDAY

0800 - 1200 **Development Phase** V.E. Team

1200 - 1300 Lunch

1300 - 1700 **Development Phase & Quality Review** V.E. Team

THURSDAY

0800 – 0900 **Prepare for Presentation** V.E. Team

0900 – 1000 **V.E. Presentation** V.E. 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 V.E. Reports will be issued within 8 business days of the workshop conclusion.

1000 – 1200 **V.E. Team Wrap-up & Final QC/QA** V.E. 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.