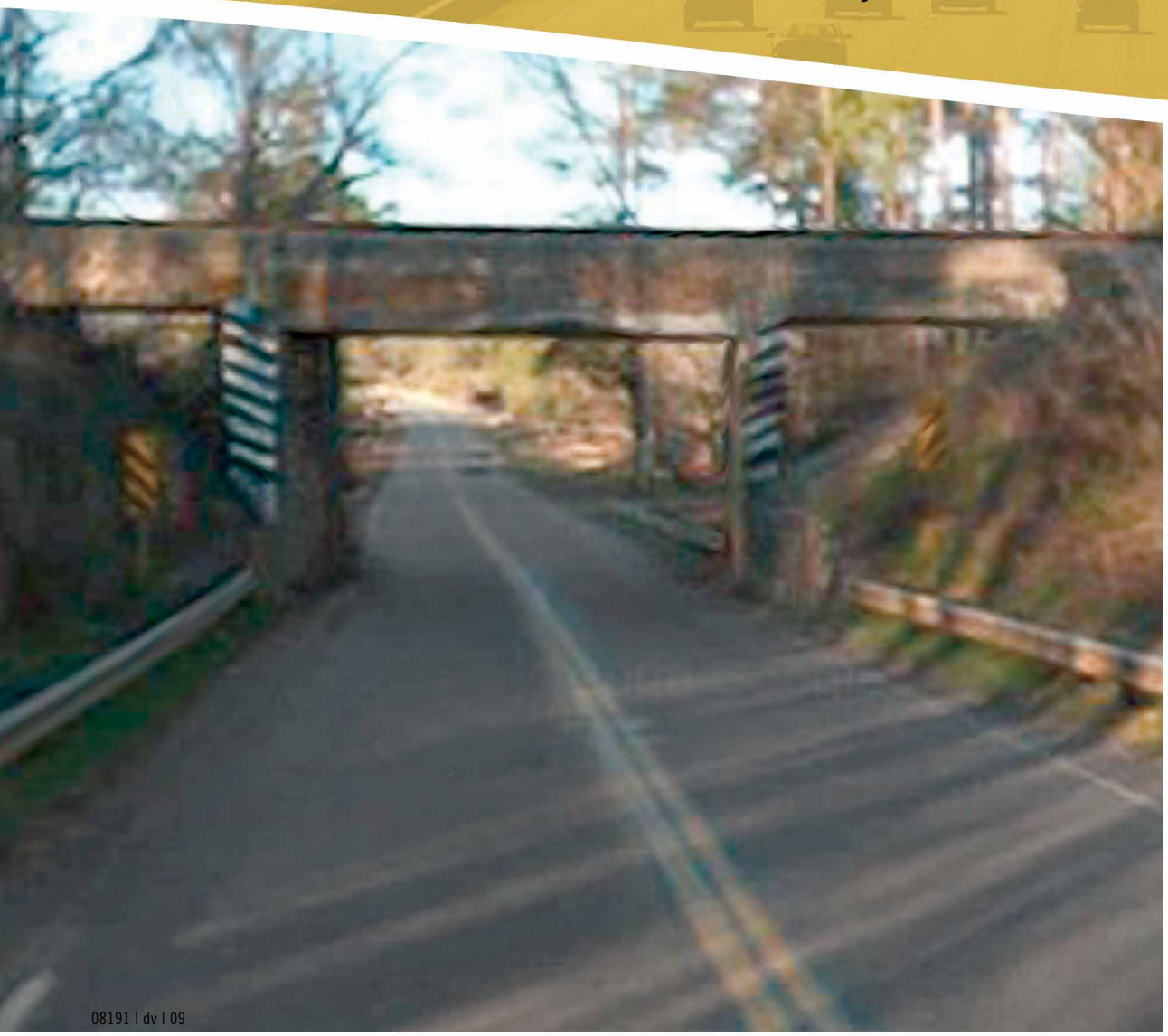
Value Engineering Study Report

Georgia Department of Transportation

STP00-0159-01(014) – P.I. No. 321880

SR 41- Replacement of CSX Bridge Over SR 41
Meriwether County



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August 19, 2009

Georgia Department of Transportation

Value Engineering Team

PBSJ

Design Team

PARSONS

August 19, 2009

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

RE: Submittal of the final Value Engineering Report
STP00-0159-01(014) – P.I. No. 321880
SR 41- Replacement of CSX Bridge over SR 41
Meriwether County

Dear Ms. Myers:

Please find enclosed two (2) hard copies and one (1) CD of our final Value Engineering Report for the Replacement of the CSX Bridge over SR 41, Meriwether County.

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

- Project goal to be "Improve Safety"
- Four (4) Alternatives to improve the project Safety and Value
- An alternative which meets the project goal and reduces the project construction time *and* cost by up to ***50%***.

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

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

Yours truly,
PBS&J

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

Randy S. Thomas, CVS
Assistant Team Leader

Value Engineering Study Report

Project No. STP00-0159-01(014)
P.I. No. 321880

SR 41- Replacement of CSX Bridge over SR 41
Meriwether County

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EXECUTIVE SUMMARY

INTRODUCTION

This report summarizes the analysis, conclusions and recommendations of the PBS&J Value Engineering Workshop Team. This study was performed during the period of August 3-6, 2009 in Atlanta, at the office of the Georgia Department of Transportation. The subject of the Value Engineering study was project STP00-0159-01(014) – P.I. No. 321880, SR 41- Replacement of CSX Bridge over SR 41, Meriwether County.

The design for the project has been prepared by Parsons. At the time of the workshop, the plans had advanced to the preliminary design level.

PROJECT DESCRIPTION

Currently, there is an existing CSX single track bridge which crosses over the two-lane SR-41/ US 27Alt, the Roosevelt Highway. This highway is classified as a rural minor arterial roadway. The existing rail line is eligible for listing as a historic place and therefore cannot be realigned. The existing bridge provides 13'-8" of vertical clearance and a horizontal clearance of 23'8".

The current project concept design is: to construct a temporary bridge adjacent to the existing; remove and replace the existing bridge; and lower the existing roadway approximately 6'-6" to provide a 16'-6" vertical clearance between the bottom of the new bridge structure and the surface of the new highway. Traffic will be detoured for approximately two months during the construction.

The estimated construction cost for the project is $6,426,387.40. In addition, Right-of-Way costs are anticipated to be $606,500 with reimbursable utilities cost estimated to be $83,200. The projected total cost for the project is $7,116,087.40.

PROJECT CONCERNS AND OBJECTIVES

- The accident rate in this section is above the state average
- Improve the clearance between vehicles and fixed objects
- To not impact possible historic property

- Reduce the impact to and or the displacement of the existing property owners
- Prevent adverse impacts to the environment
- Reduce construction delays and impacts

VALUE ENGINEERING PROCESS

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

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

This led the team through the "Speculative, Evaluation & Development phases".

During these Phases, the VE Team began to focus on any iteration of bridge design for the new structure which would minimize, or eliminate the need to remove and replace the existing roadway to have sufficient vertical clearance from the roadway to the low beam of the proposed structure. This task will have to be accomplished while keeping the horizontal and vertical location of the railroad tracks consistent from current to proposed location due to the historic nature of the railroad, without triggering a lengthy 4F process to relocate the railway in a permanent fashion.

The result was the identification of 19 possible alternatives; four (4) of which are recommended herein for implementation – see ***Study Results***

It is noted that two of the alternatives: Bridge – 5, 7 and or 8 could result in reducing the project construction time *and* cost by up to ***50%***. These alternatives are not typically considered "innovative", but rather use of current technology and proven systems. Bridge – 5 is adapting the bridge design to accommodate a two lane roadway that meets the GDOT standards.

In support of these alternatives the following article is presented.

U.S. Department of Transportation
Federal Highway Administration

"The American Association of State Highway Transportation Officials (AASHTO) Technology Implementation Group (TIG) was formed in December 2000 to facilitate rapid acceptance and implementation of high payoff and innovative technologies, and it has selected prefabricated bridge elements and systems as one of its technologies to champion for rapid implementation.

The following pages celebrate the emergence and growth of innovative prefabricated bridge technology and its implementation by forward-looking bridge owners, engineers, and builders. Prefabricated bridge elements and systems improve bridges and bridge building by affording the following advantages:

Prefabricated elements and systems make bridge building less disruptive to the traveling public.
Prefabricated elements and systems make bridges safer to build.
Prefabricated elements and systems make bridge building less disruptive to the environment.
Prefabricated elements and systems make bridge designs more constructible.

The innovative bridge projects featured in these pages solved site-specific challenges using the following prefabricated elements and systems:

Bent caps, deck panels, stay-in-place deck forms, piling, deck planks, beams of various types, segmental match-cast pier units, concrete and steel composite superstructure units, box pier units, cylinder pile support columns, ramp sections, stair sections, crash walls, and truss spans."

The following are all CSX bridges:

The following ***Summary of Alternatives and Design Suggestions*** coupled with the documentation of the developed alternatives should provide the reader with the information required to fully evaluate the merits of each of the alternatives.

Summary of Alternatives & Design Suggestions

PBSJ

PROJECT: **Georgia Department of Transportation**
STP00-0159-01(014) – P.I. No. 321880
SR 41 - Replacement of CSX Bridge over SR 41
Meriwether County

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

ALTERNATIVE NUMBER	DESCRIPTION OF ALTERNATIVE	INITIAL COST SAVINGS
	Roadway (RD)	
RD-1	Use an 8' shoulder with type 2 curb and gutter	$ 85,627
	Bridge (BR)	
BR-5	Minimize horizontal clearance to 50'; use current bridge design modified for the reduced span length, and use the direct rail fastening system to accommodate the existing road profile	$ 4,399,233
BR-7	Modify bridge design using a pre-cast pre-stressed concrete to accommodate current bridge length desired (93') and to accommodate the existing road profile	$ 4,608,231
BR-8	Minimize horizontal span to 80', use a steel through girder design to accommodate a future road widening and to accommodate the existing road profile	$ 4,514,525

STUDY RESULTS

INTRODUCTION

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

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

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

COST CALCULATIONS

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

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

Summary of Alternatives & Design Suggestions

PBS&J

PROJECT: **Georgia Department of Transportation**
STP00-0159-01(014) – P.I. No. 321880
SR 41 - Replacement of CSX Bridge over SR 41
Meriwether County

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

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Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-5**
DESCRIPTION:	**Minimize horizontal clearance to 50' using current design & Direct Fixation**	SHEET NO.:	**1** of **5**

Original Design:

The original design calls for a single span, 93' long, 24' wide bridge to replace the existing CSX RR bridge over SR 41/ US 27 due to substandard horizontal and vertical clearances. The new bridge is made up of Steel I-Beams supporting a concrete deck. The ballasted CSX rails maintain their existing elevations and geometry. In order to provide the required 16'-6" clearance to the roadway crown, the existing road profile is being lowered by 6'-6". A temporary RR bridge is called for during construction along with traffic detours for an extended period of time.

Alternative:

The alternative suggests reducing the horizontal clearance from edge of travel ways to abutments, provide crash barriers at the face of the abutment, and using a Direct Fixation rail system. The combination results in raising the low beam elevation sufficiently (while maintaining the RR profile) to obviate the need to lower the roadway profile by 6.5' and thus satisfying vertical clearance requirements.

Opportunities:

- Potential savings in construction costs and construction time
- Increase in vertical clearance while maintaining the RR profile obviates the need for lowering the roadway profile by 6.5'
- Minimal roadway closure time and thus less inconvenience to the public

Risks:

- Minimal redesign effort required since the design is in the conceptual stage
- Direct fixation system utilized

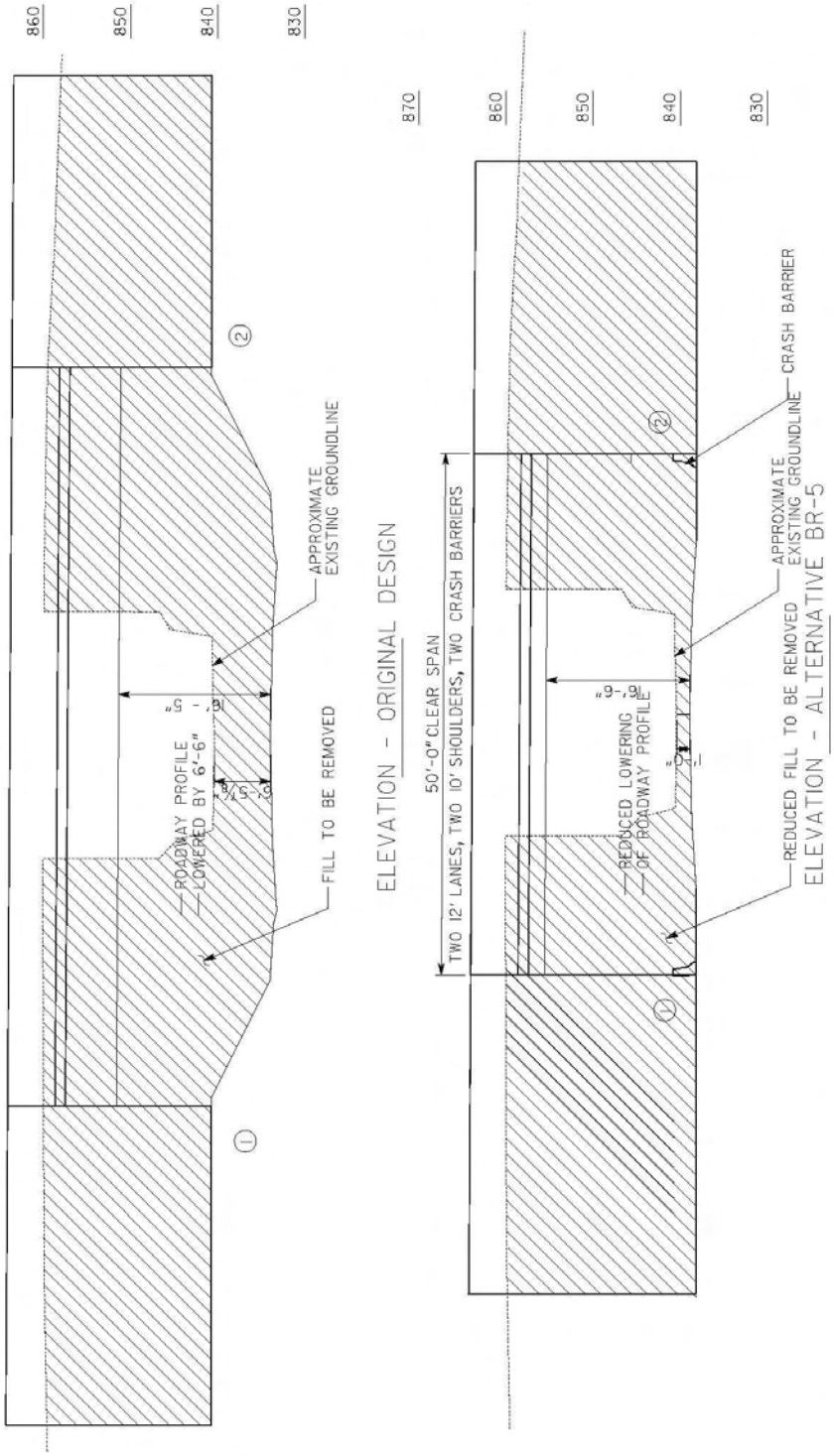
Technical Discussion:

Using a direct track fixation system on a 2" minimum (variable thickness to provide super-elevation) riser eliminates the need for a tie and the ballast. For a 48' clear span of the bridge, limiting the span to depth ratio to 15 (to minimize deflections) results in requiring steel beams that are half the depth of the proposed beam depth in the original design. With the top of inside rail at Elev. 860.89, the low beam is at Elevation 856.39. The top of the existing roadway crown is at Elevation 839.89 thus providing a vertical clearance close to 16'-6". Therefore, with this alternative, slight adjustments to the existing roadway profile would achieve the same function for the project at significant cost savings (not having to excavate 6.5" of roadway over 1250 feet).

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 5,647,037	$ 0	$ 5,647,037
ALTERNATIVE	$ 1,247,804	$ 0	$ 1,247,804
SAVINGS	$ 4,399,233	$ 0	$ 4,399,233

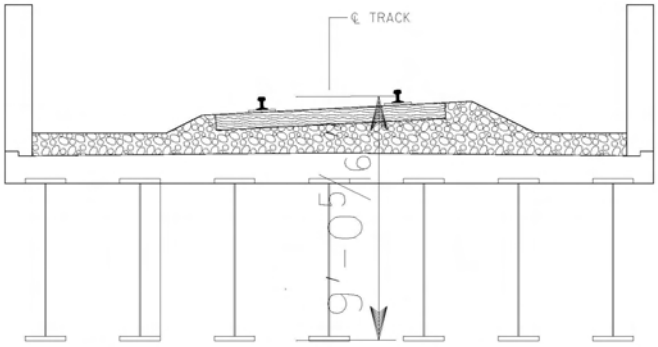
Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-5**
DESCRIPTION:	**MINIMIZE HORIZONTAL CLEARANCE TO 50' USING CURRENT DESIGN AND DIRECT FIXATION**	SHEET NO.:	**2** of **5**



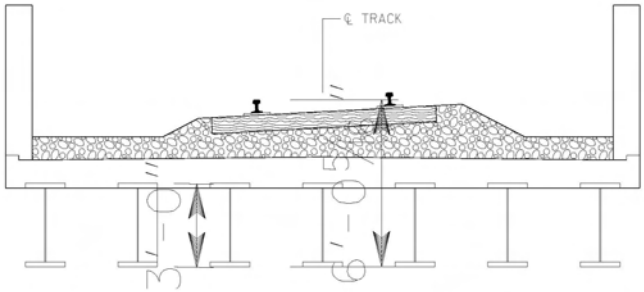
Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-5**
DESCRIPTION:	**MINIMIZE HORIZONTAL CLEARANCE TO 50' USING CURRENT DESIGN AND DIRECT FIXATION**	SHEET NO.:	**3** of **5**



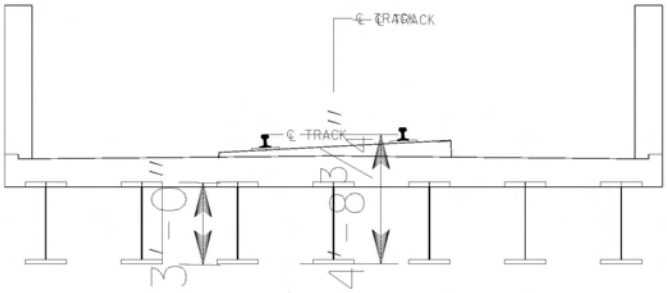
REQUIRES LOWERING ROADWAY PROFILE BY 6.5'

ORIGINAL SECTION
NO SCALE



REDUCES REQUIREMENT TO LOWER ROADWAY PROFILE BY 3'

BRIDGE REDUCED TO 50' SPAN WITH BALLASTED TRACK
NO SCALE



REDUCES REQUIREMENT TO LOWER ROADWAY PROFILE BY 4.5'

BRIDGE REDUCED TO 50' SPAN WITH DIRECT FIXATION TRACK
NO SCALE

Bridge:

Original Bridge (93' X 24') Cost = $850,000

Bridge Savings for 43' Reduction in length for a 43' X 24' Alternative Bridge

= 43'x 24'x$140/SF= $144,480

(Note: This is a conservative estimate of savings @ $140/SF).

Roadway:

Assume 5" depth removal of roadway to meet vertical clearance. Allow for 500" of roadway to be removed and reconstructed full depth to make sufficient horizontal and vertical ties to the roadway.
Buildup is assumed at:
165 lb/sy 12.5mm Superpave
330 lb/sy 19mm Superpave
440 lb/sy 25mm Superpave
12" GAB

Estimate provided to illustrate cost of reconstructing 500' of roadway.
44'w x 500'L/9= 2444 SY pavement area/48' width for GAB to accommodate barrier
2444SY x 165lb/sy/2000=202 tons 12.5mm Superpave
2444SY x 330lb/sy/2000=403 tons 19mm Superpave
2444SY x 440lb/sy/2000=538 tons 25mm Superpave
2667 SY x 1200/9=1600 tons GAB

Roadway section will require:
400LF of concrete barrier rail.
600 LF of Type W Guardrail
2 EA Type 1 Guardrail end anchor
2 EA Type 12 Guardrail end anchor

(Note: Cost of Ballast and Ties assumed to negate Cost of Direct Fixation).

Cost Worksheet

PBSJ

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) - P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-5**
DESCRIPTION:	**Minimize Horizontal Clearance to 50' using Current Design & Direct Fixation**	SHEET NO.:	**5** of **5**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS Percentage	COST/ UNIT	TOTAL
Railroad Tracks	LS	1	1,140,000	$ 1,140,000	100%	1,140,000	$ 1,140,000
Grading	LS	1	1,000,000	$ 1,000,000	10%	1,000,000	$ 100,000
Asphalt Concrete Leveling	LS	1	900,000	$ 900,000	10%	900,000	$ 90,000
Railroad Bridge	LS	1	850,000	$ 850,000	10%	850,000	$ 85,000
Right-of-Way	LS	1	606,500	$ 606,500	10%	606,500	$ 60,650
Asphalt Paving	LS	1	403,750	$ 403,750	10%	403,750	$ 40,375
Traffic Control	LS	1	300,000	$ 300,000	10%	300,000	$ 30,000
Drainage Items	LS	1	253,773	$ 253,773	10%	253,773	$ 25,377
Base	LS	1	195,000	$ 195,000	10%	195,000	$ 19,500
Guardrails	LS	1	184,000	$ 184,000	10%	184,000	$ 18,400
Temporary Railroad Bridge	LS	1	175,000	$ 175,000	100%	175,000	$ 175,000
Erosion Control	LS	1	163,302	$ 163,302	10%	163,302	$ 16,330
Concrete V Gutter	LS	1	145,730	$ 145,730	10%	145,730	$ 14,573
Miscellaneous Roadway Items	LS	1	110,500	$ 110,500	10%	110,500	$ 11,050
Utilities Reimbursement	LS	1	83,200	$ 83,200	10%	83,200	$ 8,320
Signing and Marking	LS	1	21,115	$ 21,115	10%	21,115	$ 2,112
Sub-total				$ 6,531,870			$ 1,836,687
Mark-up at 10.00%				$ 584,217			$ 183,669
TOTAL				**$ 7,116,087**			**$ 2,020,356**
Estimated Savings:							$5,095,731

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-7**
DESCRIPTION:	**Modify Bridge Design to Pre-Stressed Concrete to Accommodate Existing Road Profile and 93' span**	SHEET NO.:	**1** of **5**

Original Design:

The original design calls for a single span, 93' long, 24' wide bridge to replace the existing CSX RR bridge over SR 41/ US 27 due to substandard horizontal and vertical clearances. The new bridge is constructed of Steel I-Beams supporting a concrete deck with ballasted rails maintaining the approximate existing elevations and geometry. To gain the necessary clearances, the existing roadway is being removed and lowered 6'-6".

Alternative Design:

The VE Team suggests using Pre-cast Pre-stressed concrete "Through Girder" with direct fixation track system. This would allow the construction of the new bridge at the existing elevation without disturbing the existing roadway.

Opportunities:

- Significant savings in construction costs and construction time
- A Pre-cast/Pre-Stressed concrete Bridge is easier to construct than built in place
- Increase in vertical clearance while maintaining the RR profile will obviate the need for lowering the roadway profile by 6.5'
- Minimal roadway closure time and thus less inconvenience to the public

Risks:

- Minimal redesign effort required since the design is in the conceptual stage
- Pre-cast Pre-stressed "Through Girder" can be designed for Cooper Loading but may require a higher strength concrete

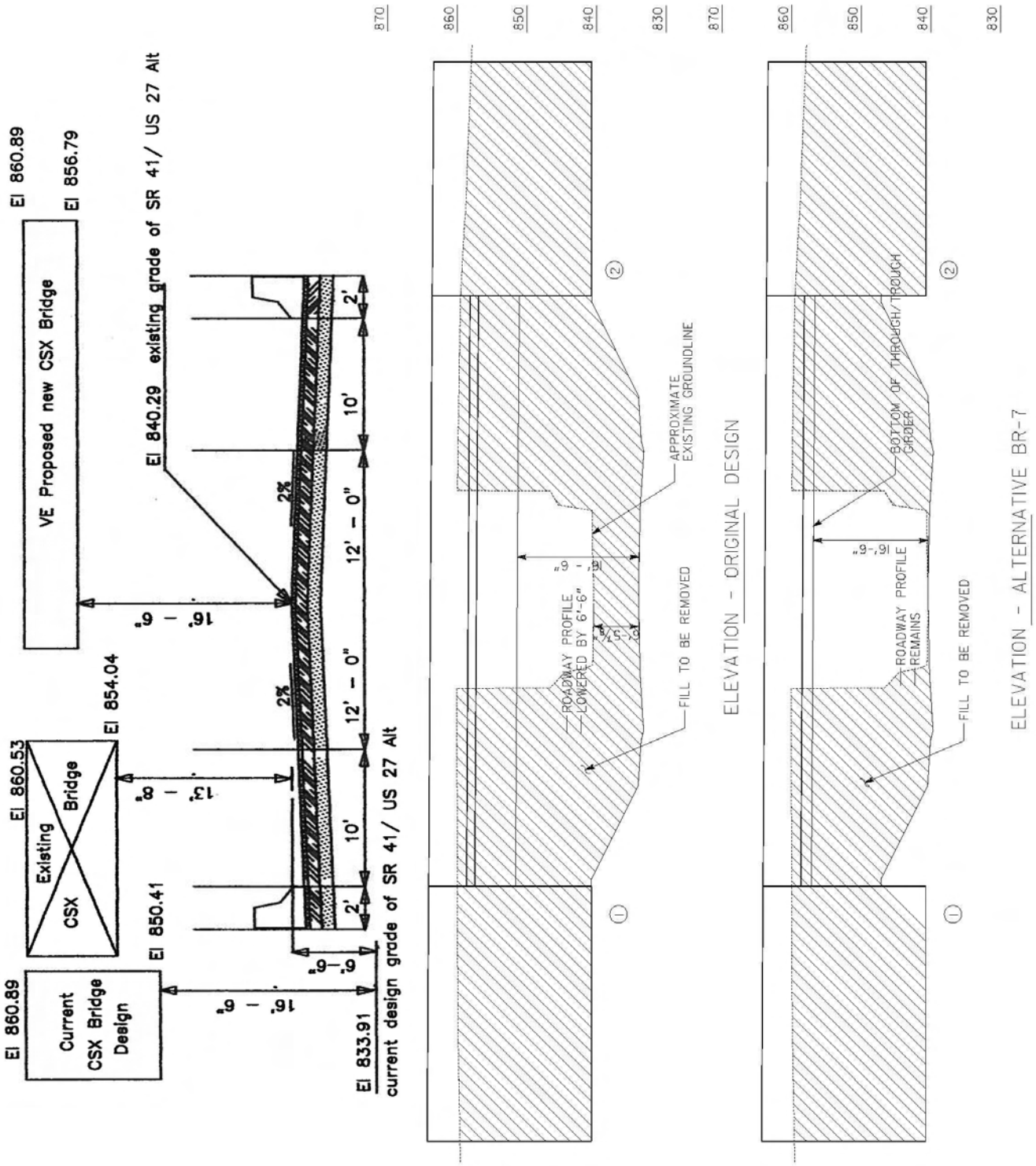
Technical Discussion:

Pre-cast Pre-stressed "Through Girder" designed for Cooper Loading may require the use of higher concrete strengths. The Precast/Prefabricated "Through Girder" could be built either as a single monolith or in two halves, with a longitudinal joint and transverse tie rods to hold the two halves together, should weight restrictions come into play. Walkways on either side of the "Through Girder" can be accommodated to comply with CSX Design Standards. The "Through Girder" is not a new concept and has been used at various locations across the United States. Various examples of its application are included. Should concrete be chosen, the nearest casting yard could be as close as Columbus, GA. Also, casting the girders on-site could be considered as the alternative is a substantial benefit to the overall project.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 7,116,087	$ 0	$ 7,116,087
ALTERNATIVE	$ 2,507,856	$ 0	$ 2,507,856
SAVINGS	$ 4,608,231	$ 0	$ 4,608,231

Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-7**
DESCRIPTION:	**Modify Bridge Design to Pre-Stressed Concrete to Accommodate Existing Road Profile and 93' span**	SHEET NO.:	**2** of **5**



Illustration

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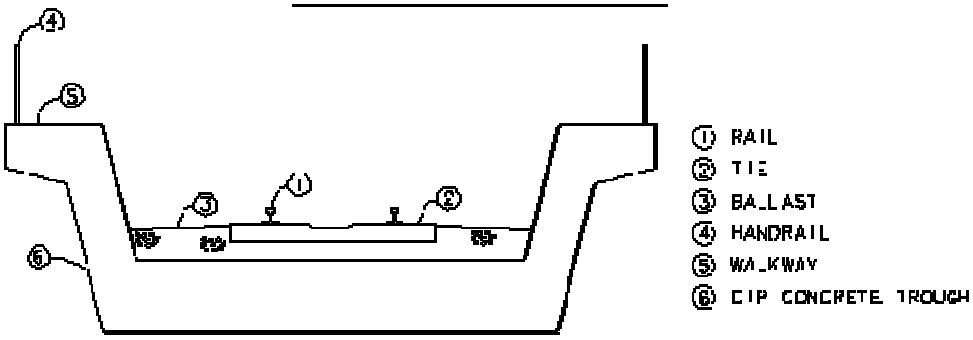
DESCRIPTION:	**Modify Bridge Design to Pre-Stressed Concrete to Accommodate Existing Road Profile and 93' span**	SHEET NO.:	**3** of **5**

- Pre-cast Pre-stressed Concrete "Through Girder" with ballast track system.

CIP CONCRETE TROUGH



SPAN RANGE	COST RANK	DEPTH T/R TO SOFFIT
50' TO 100'	2/10	5.2'

ADVANTAGES	DISADVANTAGES
LOW COST - LOW PROFILE REQUIREMENTS	EASY TO DAMAGE - DIFFICULT TO REPLACE - REQUIRES FALSEWORK

Bridge:

Original Bridge (93' X 24') Cost = $850,000

The cost of the Alternate Bridge is conservatively assumed to be the same as that for the Original Bridge.

Roadway:

It is presumed that there will be minor costs as shown on sheet 5 for essential other work.

Cost Worksheet

PBSJ

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) - P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-7**
DESCRIPTION:	**Modify Bridge Design to Pre-Stressed Concrete to Accommodate Existing Road Profile and 93' span**	SHEET NO.:	**5** of **5**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Railroad Tracks	LS	1	1,140,000	$1,140,000	100%	1,140,000	$ 1,140,000
Grading	LS	1	1,000,000	$1,000,000	0%	1,000,000	$ -
Asphalt Concrete Leveling	LS	1	900,000	$ 900,000	0%	900,000	$ -
Railroad Bridge (concrete)	LS	1	850,000	$ 850,000	100%	850,000	$ 850,000
Right-of-Way	LS	1	606,500	$ 606,500	0%	606,500	$ -
Asphalt Paving	LS	1	403,750	$ 403,750	0%	403,750	$ -
Traffic Control	LS	1	300,000	$ 300,000	20%	300,000	$ 60,000
Drainage Items	LS	1	253,773	$ 253,773	10%	253,773	$ 25,377
Base	LS	1	195,000	$ 195,000	0%	195,000	$ -
Guardrails	LS	1	184,000	$ 184,000	0%	184,000	$ -
Temporary Railroad Bridge	LS	1	175,000	$ 175,000	100%	175,000	$ 175,000
Erosion Control	LS	1	163,302	$ 163,302	10%	163,302	$ 16,330
Concrete V Gutter	LS	1	145,730	$ 145,730	0%	145,730	$ -
Miscellaneous Roadway Items	LS	1	110,500	$ 110,500	10%	110,500	$ 11,050
Utilities Reimbursement	LS	1	83,200	$ 83,200	0%	83,200	$ -
Signing and Marking	LS	1	21,115	$ 21,115	10%	21,115	$ 2,112
Sub-total				$ 6,531,870			$ 2,279,869
Mark-up at 10.00%				$ 584,217			$ 227,987
TOTAL				**$ 7,116,087**			**$ 2,507,856**
Estimated Savings:							$4,608,231

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-8**
DESCRIPTION:	**Minimize Horizontal Span to 80' and use Steel Through Girder**	SHEET NO.:	**1** of 6

Original Design:

The original design calls for a single span, 93' long, 24' wide bridge to replace the existing CSX RR bridge over SR 41/ US 27 due to substandard horizontal and vertical clearances. The new bridge is made up of Steel I-Beams supporting a concrete deck. The ballasted CSX rails maintain their existing elevations and geometry. In order to provide the required 16'-6" clearance to the roadway crown, the existing road profile is being lowered by 6'-6". A temporary RR bridge is called for during construction along with traffic detours for an extended period of time.

Alternative:

The alternative suggests constructing an 80' steel through girder bridge to accommodate the possible future widening of SR 41. An 80' span results in raising the low beam elevation sufficiently (while maintaining the RR profile) to obviate the need to lower the roadway profile by 6.5' and thus satisfying vertical clearance requirements.

Opportunities:

- Potential savings in construction costs and construction time
- Increase in vertical clearance while maintaining the RR profile obviates the need for lowering the roadway profile by 6.5'
- Minimal roadway closure time and thus less inconvenience to the public

Risks:

- Minimal redesign effort required since the design is in the conceptual stage

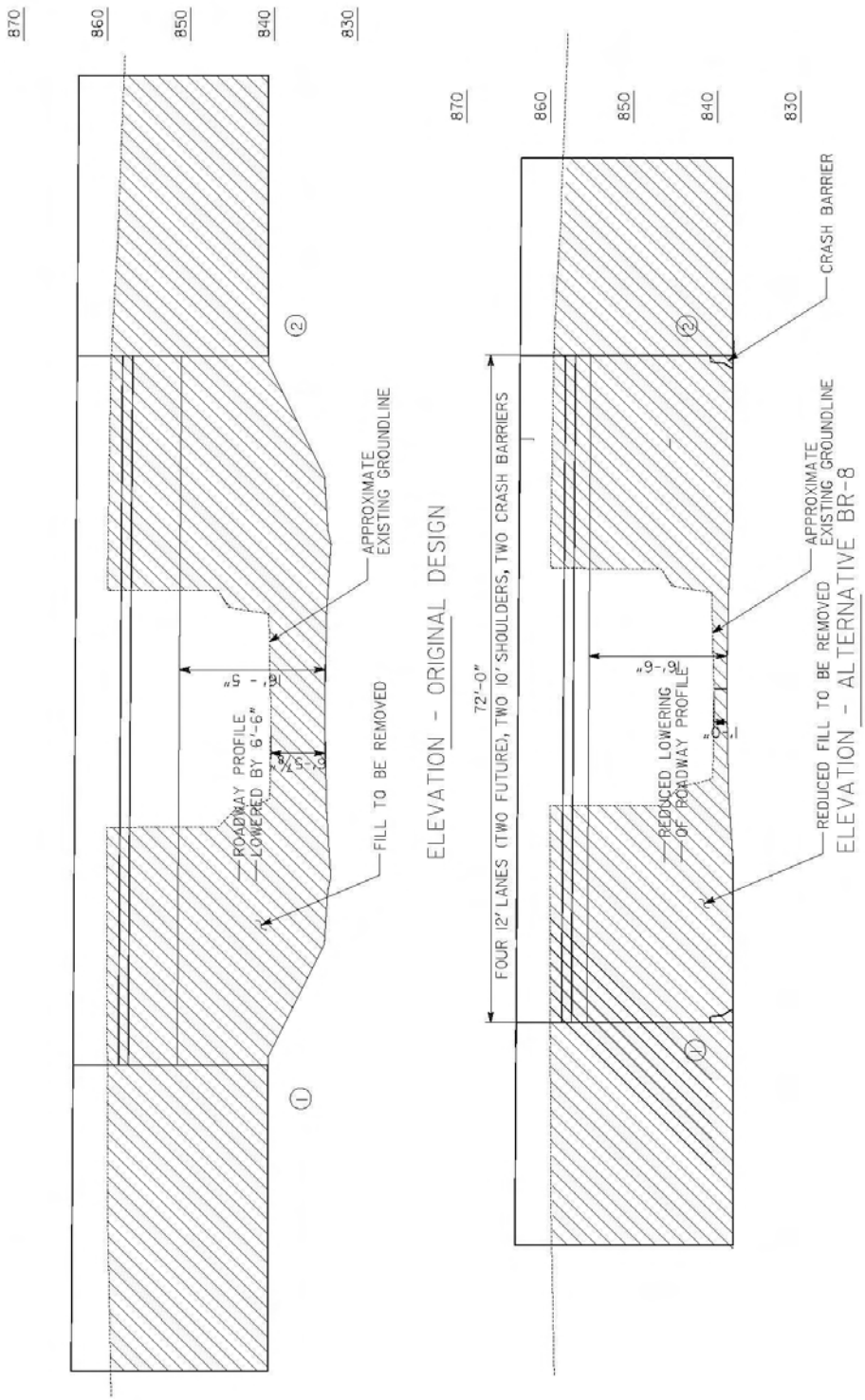
Technical Discussion:

Steel Through Girder systems are commonly accepted designs found in use with the CSX railroad. It use would allow the existing roadway to remain and also provide for a future widening of SR 41.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 7,116,087	$ 0	$ 7,116,087
ALTERNATIVE	$ 2,601,562	$ 0	$ 2,601,562
SAVINGS	$ 4,514,525	$ 0	$ 4,514,525

Illustration

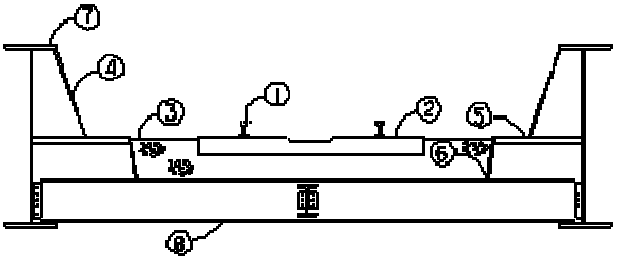
PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-8**
DESCRIPTION:	**Minimize Horizontal Span to 80' and use a Steel Through Girder**	SHEET NO.:	**2** of 6



Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-8**
DESCRIPTION:	**Minimize Horizontal Span to 80' and use Steel Through Girder**	SHEET NO.:	3 of 6

STEEL THROUGH GIRDER



1. RAIL
2. TIE
3. BALLAST
4. BRACE
5. SIDEWALK
6. STEEL BALLAST PAN
7. STEEL PLATE GIRDER
8. STEEL FLOOR BEAM

SPAN RANGE	COST RANK	DEPTH T/R TO SOFFIT
50' TO 150'	9/10	4.1'

ADVANTAGES	DISADVANTAGES
- LOW PROFILE REQUIREMENTS (SLIGHTLY HIGHER W/CONCRETE BALLAST PAN)	- EASY TO DAMAGE - DIFFICULT TO REPLACE - LIMITED TO ONE TRACK BETWEEN GIRDERS (TWO POSSIBLE WITH DEPTH INCREASE)

Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-8**
DESCRIPTION:	**Minimize Horizontal Span to 80' and use Steel Through Girder**	SHEET NO.:	**4** of **6**

ALL EXAMPLES SHOWN HERE ARE CSX BRIDGES

Bridge:

Original Bridge (93' X 24') Cost = $850,000

Bridge Savings for about 15' Reduction in length for about a 80' X 24' Alternative Bridge is neglected (**conservative**).

Roadway:

Assume 5" depth removal of roadway to meet vertical clearance. Allow for 500" of roadway to be removed and reconstructed full depth to make sufficient horizontal and vertical ties to the roadway.
Buildup is assumed at:
165 lb/sy 12.5mm Superpave
330 lb/sy 19mm Superpave
440 lb/sy 25mm Superpave
12" GAB

Estimate provided to illustrate cost of reconstructing 500' of roadway.
44'w x 500'L/9= 2444 SY pavement area/48' width for GAB to accommodate barrier
2444SY x 165lb/sy/2000=202 tons 12.5mm Superpave
2444SY x 330lb/sy/2000=403 tons 19mm Superpave
2444SY x 440lb/sy/2000=538 tons 25mm Superpave
2667 SY x 1200/9=1600 tons GAB

Roadway section will require:
400LF of concrete barrier rail.
600 LF of Type W Guardrail
2 EA Type 1 Guardrail end anchor
2 EA Type 12 Guardrail end anchor

Cost Worksheet

PBSJ

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) - P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**BR-8**
DESCRIPTION:	**Minimize Horizontal Span to 80' and use Steel Through Girder**	SHEET NO.:	6 of **6**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Railroad Tracks	LS	1	1,140,000	$1,140,000	100%	1,140,000	$ 1,140,000
Grading	LS	1	1,000,000	$1,000,000	5%	1,000,000	$ 50,000
Asphalt Concrete Leveling	LS	1	900,000	$ 900,000	5%	900,000	$ 45,000
Railroad Bridge (steel)	LS	1	850,000	$ 850,000	100%	850,000	$ 850,000
Right-of-Way	LS	1	606,500	$ 606,500	0%	606,500	$ -
Asphalt Paving	LS	1	403,750	$ 403,750	5%	403,750	$ 20,188
Traffic Control	LS	1	300,000	$ 300,000	10%	300,000	$ 30,000
Drainage Items	LS	1	253,773	$ 253,773	10%	253,773	$ 25,377
Base	LS	1	195,000	$ 195,000	0%	195,000	$ -
Guardrails	LS	1	184,000	$ 184,000	0%	184,000	$ -
Temporary Railroad Bridge	LS	1	175,000	$ 175,000	100%	175,000	$ 175,000
Erosion Control	LS	1	163,302	$ 163,302	10%	163,302	$ 16,330
Concrete V Gutter	LS	1	145,730	$ 145,730	0%	145,730	$ -
Miscellaneous Roadway Items	LS	1	110,500	$ 110,500	10%	110,500	$ 11,050
Utilities Reimbursement	LS	1	83,200	$ 83,200	0%	83,200	$ -
Signing and Marking	LS	1	21,115	$ 21,115	10%	21,115	$ 2,112
Sub-total				$ 6,531,870			$ 2,365,057
Mark-up at 10.00%				$ 584,217			$ 236,506
TOTAL				**$ 7,116,087**			**$ 2,601,562**
Estimated Savings:							$4,514,525

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**RD-1**
DESCRIPTION:	**Use 8' shoulder with a Type 2 curb and gutter**	SHEET NO.:	**1** of **4**

Original Design:

The original design utilizes a 10' improved shoulder. The paved portion of the shoulder varies from 6.5' to 10.0' and incorporates a valley gutter and area inlets for handling the drainage.

Alternative:

The alternative would be to utilize an 8' shoulder with 8' paved and incorporate a Type 2 curb and gutter for handling the drainage.

Opportunities:

- Provide a consistent typical section for the road user
- Improve drainage
- Simplify construction
- Reduce ROW costs
- Improve back slopes
- Relocate the inlets from the path of direct traffic

Risks:

- Moderate design effort

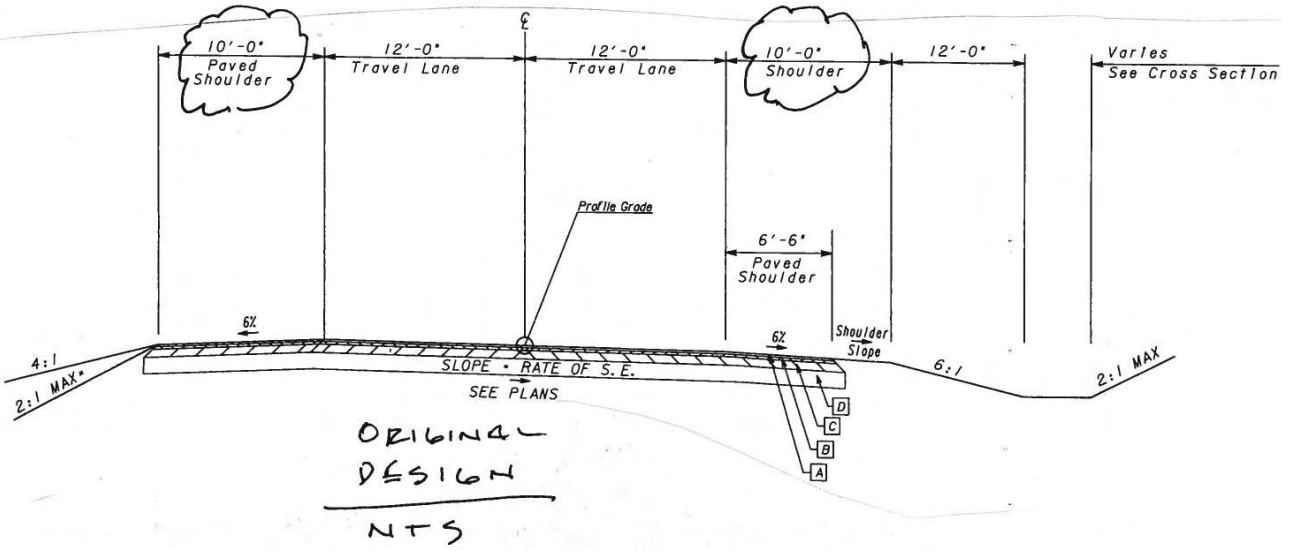
Technical Discussion:

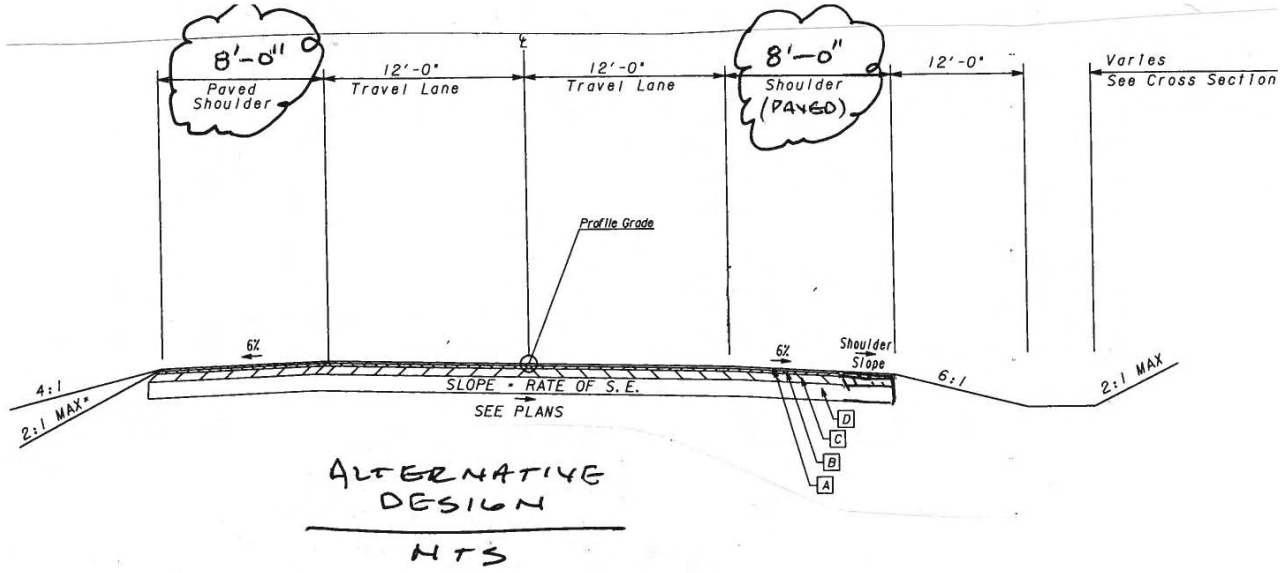
AASHTO's specifies a minimum 8' improved shoulder for a Rural Minor Arterial (page 448, Geometric Design of Highways and Streets). By using an 8' shoulder and paving the entire width you can reduce cost and provide the road user a consistent typical section. It also eases construction by eliminating multiple variations in the paving sections. By utilizing a Type 2 curb and gutter the hydraulic efficiency can be increased and the inlet can be move from the direct traffic on the shoulder. Reducing the shoulder width will also provide some flattening of the side slopes in critical areas. Minor modification of the Construction Sequence may be required. Two possible ways to modify the sequence to accommodate the design are as follows:
Alternative 1- Construct from Station 10+78 to Station 25+00 during the complete road closure. Construct the area from station 25+00 to Station 31+00 with a daytime single lane closure on a 3:1 "wedge" to eliminate overnight drop-offs.
Alternative 2- Construct all of the roadway construction during the complete road closure. This will result in even more savings due to the elimination of all temporary paving and temporary concrete barrier.

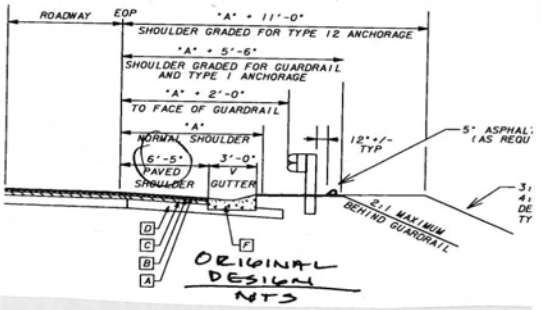
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 786,929	$ 0	$ 786,929
ALTERNATIVE	$ 701,302	$ 0	$ 701,302
SAVINGS	$ 85,627	$ 0	$ 85,627

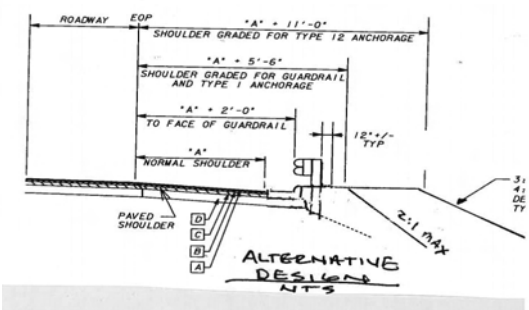
Illustration

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**RD-1**
DESCRIPTION:	**Use 8' shoulder with a Type 2 curb and gutter**	SHEET NO.:	**2** of **4**









Calculations

PROJECT:	**Georgia Department of Transportation** **STP00-0159-01(014) – P.I. No. 321880** **SR 41 Replacement of CSX Bridge over SR 41** **Meriwether County**	ALTERNATIVE NO.:	**RD-1**
DESCRIPTION:	**Use 8' shoulder with a Type 2 curb and gutter**	SHEET NO.:	**3** of **4**

Assumed pavement buildup - 165#/sy 12.5 mm superpave, 220#/sy 19.0 mm superpave, 440#/sy 25.0 mm superpave and 12" GAB

Original Design Paving:

Shoulder Paving and GAB w/Gutter Section

6.5 foot- 11+00 to 14+75 right,27+35 to 29+85 left, 33+45 to 38+75 left => (1156' x 6.5')=7,514 sf / 9 sf / sy => 835 sy

10.0 foot- 11+00 to 19+92 left,30+62 to 35+86 left => (1516' x 10.0)=15,160 sf / 9 sf / sy => 1,685 sy

12.0 foot- 24+00 to 27+35 left,25+75 to 30+62 left, 29+85 to 33+45 right, 35+86 to 38+76 left => (1472' x 12.0')= 17,664 sf / 9 sf / sy => 1,963 sy

Shoulder w/Gutter Section - Paving

6.5 foot- 14+75 to 25+75 right, 19+92 to 24+00 left => (1508' x 6.5') / 9 sf / sy => 1,090 sy

GAB w/Gutter Section -

10.5 foot- 14+75 to 25+75 right, 19+92 to 24+00 left => (1508' x 10.5')= 15,834 sf / 9 sf / sy => 1,760 sy

12" GAB-((7,514 sf + 15,160 sf + 17,664 sf + 15,834 sf) x 1.0 ft) x (135#/cf) / (2000#/ton) => 3,791 tons

12.5 mm Superpave- (835 sy + 1,685 sy + 1,963 sy + 1090 sy) x (165#/sy) / (2000#/ton) => 460 tons

19.0 mm Superpave- (835 sy + 1,685 sy + 1,963 sy + 1090 sy) x (220#/sy) / (2000#/ton) => 613 tons

25.0 mm Superpave- (835 sy + 1,685 sy + 1,963 sy + 1090 sy) x (440#/sy) / (2000#/ton) => 1,226 tons

Alternative Design Paving:

Shoulder Paving wo/Guardrail

8.0 foot- 11+00 to 17+00 right, 30+25 to 36+00 right,11+00 to 20+40 left, 27+35 to 29+85 left, 32+80 to 38+76 left => (3,161' x 8.0)=25,488 sf / 9 sf / sy => 2,810 sy

Shoulder Paving w/Guardrail

10.0 foot- 17+00 to 30+25 right, 36+00 to 38+76 right, 20+40 to 27+35 left, 29+85 to 32+80 left => (2,591 x 10.0)= 25,910 sf / 9 sf / sy => 2,879 sy

GAB wo/Gutter Section -

11+00 to 14+75 left,11+00 to 19+92 right, 25+75 to 38+75 left,24+00 to 38+75 right => (4042' x 8.0)= 32,336 sf / 9 sf / sy => 3,593 sy

GAB w/Gutter Section -

11.0 foot- 14+75 to 25+75 left, 19+92 to 24+00 right => (1508' x 11.0)= 16,588sf / 9 sf / sy => 1,844 sy

12" GAB-((32,336 sf + 16,588 sf)) x 1.0 ft) x (135#/cf) / (2000#/ton) => 3,302 tons

12.5 mm Superpave- (2,810 sy + 2,879 sy) x (165#/sy) / (2000#/ton) => 469 tons

19.0 mm Superpave- (2,810 sy + 2,879 sy) x (220#/sy) / (2000#/ton) => 626 tons

25.0 mm Superpave- (2,810 sy + 2,879 sy) x (440#/sy) / (2000#/ton) => 1,251 tons

Assume the change in sequence will reduce the Lump Sum TCP costs by 15% due to a reduction in the amount of required temporary pavement and the elimination of the use of concrete median barrier.

Assume that due to increased hydraulic efficiency the number of inlets should be able to be reduced by half.

Cost Worksheet

PBS&J

PROJECT: **Georgia Department of Transportation**
STP00-0159-01(014) - P.I. No. 321880
SR 41 Replacement of CSX Bridge over SR 41
Meriwether County

ALTERNATIVE NO.: **RD-1**

DESCRIPTION: **Use 8' shoulder with a Type 2 curb and gutter**

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

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
12.5 mm Superpave	TN	460	$ 95.00	$ 43,700	469	$ 95.00	$ 44,555
19.0 mm Superpave	TN	613	$ 95.00	$ 58,235	626	$ 95.00	$ 59,470
25.0 mm Superpave	TN	1,226	$ 95.00	$ 116,470	1251	$ 95.00	$ 118,845
GAB	SY	6,241	$ 22.50	$ 140,423	5436	$ 22.50	$ 122,310
Drop Inlets	EA	6	$ 4,407.97	$ 26,448	3	$ 4,407.97	$ 13,224
Traffic Control	LS	1	$ 300,000	$ 300,000	0.85	$ 300,000	$ 255,000
V-Gutter	LF	1,508	$ 19.97	$ 30,115	0	$ 19.97	$ -
C&G Type 2	LF	0	$ 16.01	$ -	1508	$ 16.01	$ 24,143
				$ -			$ -
				$ -			$ -
				$ -			$ -
				$ -			$ -
				$ -			$ -
				$ -			$ -
				$ -			$ -
				$ -			$ -
Sub-total				$ 715,390			$ 637,547
Mark-up at 10.00%				$ 71,539			$ 63,755
TOTAL				**$ 786,929**			**$ 701,302**
Estimated Savings:							$85,627

PROJECT DESCRIPTION

INTRODUCTION

The subject of the Value Engineering study was project STP00-0159-01(014) – P.I. No. 321880, SR 41- Replacement of CSX Bridge over SR 41, Meriwether County.

The design for the project has been prepared by Parsons. At the time of the workshop, the plans had advanced to the preliminary design level.

PROJECT DESCRIPTION

Currently, there is an existing CSX single track bridge which crosses over the two-lane SR-41/ US 27Alt, the Roosevelt Highway. This highway is classified as a rural minor arterial roadway. The existing rail line is eligible for listing as a historic place and therefore cannot be realigned. The existing bridge provides13'-8" of vertical clearance and a horizontal clearance of 23'-8".

The current project concept design is: to construct a temporary bridge adjacent to the existing; remove and replace the existing bridge; and lower the existing roadway approximately 6'-6" to provide a 16'-6" vertical clearance between the bottom of the new bridge structure and the surface of the new highway. Traffic will be detoured for approximately two months during the construction.

The estimated construction cost for the project is $6,426,387.40. In addition, Right-of-Way costs are anticipated to be $606,500 with reimbursable utilities cost estimated to be $83,200. The projected total cost for the project is $7,116,087.40.

REPRESENTATIVE DOCUMENTS

- Georgia Department of Transportation
  - Construction Cost Estimates
  - Preliminary Right-of-Way Cost Estimate
  - Concept Reports
  - Project Location Maps
  - Detour Map
  - Typical Bridge Section
  - Typical Road Section

The VE Team utilized the GDOT supplied project materials noted above plus the preliminary plans provided by Parsons.

Preliminary Right of Way Cost Estimate

Phil Copeland
Right of Way Administrator
By: LaShone Alexander

Date: July 02, 2009
Project: STP-159 (1) Meriwether
Existing/Required R/W: Varies/Varies
P.I. Number: 321880
No. Parcels: 11
Project Termini : SR 41/US 27/ Roosevelt Highway from Sta 10+70.18 to Sta 38+28.45
Project Description: SR 41 Under CSX Railroad

Land:

Agricultural/Conservation/Exempt Required R/W 1.2221 Ac @ $ 20,000.00/Ac		$ 24,442.00
Residential Required R/W 1.6447 Ac @ $ 35,000.00/Ac		$ 57,564.00
Permanent Easement 1.57 Ac @ $ 25,000.00/Ac X 50%		$ 12,500.00
		$ 94,506.00
Improvements : landscaping, fencing, residence misc. site improvements		$ 110,000.00
Relocation: Residential (1) Commercial (0)	$ 40,000	$ 40,000.00
		$
Damage : Proximity (0)	$	
Cost to Cure (0)	$	
		$
	Net Cost	$ 244,506.00

Net Cost		$ 244,506.00
Scheduling Contingency	55 %	$ 134,478.00
Adm/Court Cost	60 %	$ 227,390.00
		$606,374.00

Total Cost $ 606,500.00

Note: The Market Appreciation (40%) is not included in the updated Preliminary Cost Estimate.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE **STP-159-1(14) , Meriwether County, P.I. # 321880**
SR-41 Replace SCL Railroad Bridge over SR-41

OFFICE Thomaston

DATE June 26, 2009

FROM Kerry Gore, District Utilities Engineer

TO Bill Rountree, Project Manager

SUBJECT **PRELIMINARY UTILITY COST (ESTIMATE)**

As requested by your office, we are furnishing you with a Preliminary Utility Cost estimate for each utility with facilities potentially located within the project limits.

FACILITY OWNER	NON-REIMBURSABLE	REIMBURSABLE
Charter Communications	14,000	0
City of Warm Springs	51,000	0
Georgia Power Distribution	0	64,000
Windstream	12,000	0
TOTALS	**$77,000**	**$64,000**
30% Utilities Contingency		**$19,200**
Total Reimbursement Cost		**$83,200**

Total Preliminary Utility Cost Estimate **$160,200**.

If you have any questions, please contact Kim Brown at 706-646-6695.

KG/pls

cc: Jeff Baker, P.E., State Utilities Engineer *(via: e-mail)*
Angela Whitworth, Office of Financial Management *(via: e-mail)*
Havard Seldon, Area Engineer *(via: e-mail)*

Estimate Report for file "STP-159-1(14)"

Section ROADWAY ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	Lump	LS	300000.00	TRAFFIC CONTROL - STP-154-1(14)	300000.00
153-1300	1	EA	75000.00	FIELD ENGINEERS OFFICE TP 3	75000.00
210-0100	Lump	LS	1000000.00	GRADING COMPLETE - STP-154-1(14)	1000000.00
310-5060	1000	SY	15.00	GR AGGR BASE CRS, 6 INCH, INCL MATL	15000.00
310-5120	8000	SY	22.50	GR AGGR BASE CRS, 12 INCH, INCL MATL	180000.00
318-3000	180	TN	25.00	AGGR SURF CRS	4500.00
402-1812	9000	TN	100.00	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	900000.00
402-3113	1250	TN	95.00	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	118750.00
402-3121	2000	TN	95.00	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	190000.00
402-3190	1000	TN	95.00	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	95000.00
413-1000	1500	GL	3.00	BITUM TACK COAT	4500.00
441-3999	5605	LF	26.00	CONCRETE V GUTTER	145730.00
446-1100	6000	LF	3.50	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	21000.00
634-1200	50	EA	110.00	RIGHT OF WAY MARKERS	5500.00
641-1200	6000	LF	26.50	GUARDRAIL, TP W	159000.00
641-5001	10	EA	650.00	GUARDRAIL ANCHORAGE, TP 1	6500.00
641-5012	10	EA	1850.00	GUARDRAIL ANCHORAGE, TP 12	18500.00
				Section Sub Total:	**$3,238,980.00**

Section PERMANENT EROSION CONTROL ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
603-2181	55	SY	45.10	STN DUMPED RIP RAP, TP 3, 18 IN	2480.50
603-7000	55	SY	5.22	PLASTIC FILTER FABRIC	287.10
700-6910	4	AC	1054.05	PERMANENT GRASSING	4216.20
700-7000	9	TN	60.44	AGRICULTURAL LIME	543.96
700-7010	11	GL	21.65	LIQUID LIME	238.15
700-8000	4	TN	348.14	FERTILIZER MIXED GRADE	1392.56
700-8100	455	LB	2.55	FERTILIZER NITROGEN CONTENT	1160.25
715-2200	9381	SY	2.11	BITUMINOUS TREATED ROVING, WATERWAYS	19793.91
				Section Sub Total:	**$30,112.63**

Section TEMPORARY EROSION CONTROL ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	6	AC	778.51	TEMPORARY GRASSING	4671.06
163-0240	67	TN	181.67	MULCH	12171.89
163-0300	3	EA	2872.37	CONSTRUCTION EXIT	8617.11
163-0503	10	EA	538.47	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3	5384.70
163-0521	300	EA	200.00	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS	60000.00
163-0550	2	EA	308.76	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	617.52
165-0010	675	LF	0.80	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	540.00
165-0040	129	EA	104.09	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	13427.61
165-0087	10	EA	150.00	MAINTENANCE OF SILT CONTROL GATE, TP 3	1500.00
165-0088	10	EA	100.00	MAINTENANCE OF SILT CONTROL GATE, TP 4	1000.00
165-0105	5	EA	110.84	MAINTENANCE OF INLET SEDIMENT TRAP	554.20
167-1000	5	EA	1350.00	WATER QUALITY MONITORING AND SAMPLING	6750.00
167-1500	15	MO	1035.00	WATER QUALITY INSPECTIONS	15525.00
171-0010	1350	LF	1.80	TEMPORARY SILT FENCE, TYPE A	2430.00
				Section Sub Total:	**$133,189.09**

Section RAILROAD ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
800-1000	1700	SF	500.00	RAILROAD BRIDGE	850000.00
800-1001	700	SF	250.00	TEMPORARY RAILROAD BRIDGE	175000.00
800-2000	2850	LF	400.00	RAILROAD TRACKS	1140000.00
				Section Sub Total:	**$2,165,000.00**

Section DRAINAGE ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
441-0204	500	SY	35.46	PLAIN CONC DITCH PAVING, 4 IN	17730.00
550-1180	491	LF	42.63	STORM DRAIN PIPE, 18 IN, H 1-10	20931.33
550-1240	37	LF	53.78	STORM DRAIN PIPE, 24 IN, H 1-10	1989.86
550-1360	65	LF	81.70	STORM DRAIN PIPE, 36 IN, H 1-10	5310.50
550-1480	100	LF	122.66	STORM DRAIN PIPE, 48 IN, H 1-10	12266.00
550-2180	1040	LF	28.20	SIDE DRAIN PIPE, 18 IN, H 1-10	29328.00
550-4118	44	EA	636.02	FLARED END SECTION 18 IN, SIDE DRAIN	27984.88
550-4218	10	EA	644.87	FLARED END SECTION 18 IN, STORM DRAIN	6448.70
550-4224	10	EA	882.93	FLARED END SECTION 24 IN, STORM DRAIN	8829.30
550-4236	10	EA	1221.96	FLARED END SECTION 36 IN, STORM DRAIN	12219.60
550-4248	2	EA	2555.36	FLARED END SECTION 48 IN, STORM DRAIN	5110.72
576-1018	500	LF	34.93	SLOPE DRAIN PIPE, 18 IN	17465.00
668-2100	20	EA	4407.97	DROP INLET, GP 1	88159.40
				Section Sub Total:	**$253,773.29**

Section SIGNING AND MARKING ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	64	SF	15.31	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	979.84
636-1033	78	SF	20.72	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	1616.16
636-1041	71	SF	42.01	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 9	2982.71
636-2070	353	LF	8.38	GALV STEEL POSTS, TP 7	2958.14
653-0120	8	EA	73.73	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	589.84
653-1501	5375	LF	0.51	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	2741.25
653-1502	6832	LF	0.52	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	3552.64
653-1704	162	LF	5.02	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	813.24
653-1804	1285	LF	2.15	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	2762.75
653-3501	405	GLF	0.50	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	202.50
653-6004	182	SY	3.07	THERMOPLASTIC TRAF STRIPING, WHITE	558.74
653-6006	274	SY	3.21	THERMOPLASTIC TRAF STRIPING, YELLOW	879.54
654-1001	100	EA	3.64	RAISED PVMT MARKERS TP 1	364.00
654-1003	30	EA	3.80	RAISED PVMT MARKERS TP 3	114.00
				Section Sub Total:	**$21,115.35**

Total Estimated Cost: $5,842,170.36

Subtotal Construction Cost	**$5,842,170.36**
E&C Rate 10.0 %	$584,217.04
Inflation Rate 0.0 % @ 0 Years	$0.00
Total Construction Cost	**$6,426,387.40**
Right Of Way	$696,800.00

ReImb. Utilities	$32,000.00
Grand Total Project Cost	**$7,155,187.40**

Revised Concept Report

For

STP-159-1(14)
SR 41 under CSX Railroad
Meriwether County
P.I. No. 321880

Prepared for

Georgia Department of Transportation

Prepared by:

PARSONS TRANSPORTATION GROUP INC.
5390 Triangle Parkway
Suite 100
Norcross, Georgia 30092

May 2008

REVISED PROJECT CONCEPT REPORT

SR 41 under CSX Railroad
Meriwether County

Project Number: STP-159-1(14)
P.I. No. 321880

Need & Purpose:
The existing railroad bridge over SR 41/US 27 Alt./Roosevelt Highway has both substandard horizontal and vertical clearance for the highway traffic below. The horizontal clearance is 23'-8" and the vertical clearance is 13'-8". In addition, the existing railroad bridge is located on curve, creating a sight distance issue.

The 2006 ADT for SR 41 is 3400 vehicles per day (vpd) with a 24 hour truck count of 8%. The ADT is estimated to increase 59 % by 2029 to 6100 vpd. The 2009 level of service for SR 41 is at a level "A". With a 58% increase in traffic by the year 2029 the level of service will remain at the same level of service "A". SR 41 experienced a total of 10 accidents during the three year period between 2004 and 2006. Of these, 4 accidents (40%) resulted in property damage only, while 6 accidents (60%) resulted in injury. 60% of all accidents did not involve collision with a motor vehicle and 20% of all accidents were rear end. A comparison between the accident rates and the statewide rates for all three years shows that the accident and injury rates along this Rural Minor Arterial section of SR 41 are higher than the statewide average.

The purpose of this project is to replace the existing substandard bridge carrying CSX Railroad over SR 41 and improve safety of both vehicular and railroad traffic. The existing railroad bridge substandard horizontal and vertical clearance results in an unsafe environment for the traffic on SR 41 as well as on CSX Railroad; hence, the need to replace the existing bridge.

Project Location:
This project is located one mile north of Warm Springs, Georgia (See Figure 1.1: Project Location Map) beginning south of the existing CSX railroad bridge and ending north of the bridge. The proposed length of the project is 0.53 miles, beginning mile point 7.27 (Meriwether Co.) and ending mile point 7.80 (Meriwether Co.). The CSX Railroad realignment begins at mile point 794.95 west of SR 41, and ends at mile point 795.49 east of SR 41.

Description of the approved concept:
The approved concept report proposed a permanent railroad detour with a new railroad bridge, which is approximately 195 ft. long and requires the reconstruction of 4,700 linear feet of track. The new track work and bridge are proposed to be located just south of the existing site. State Route 41 must be lowered in order to provide adequate vertical clearance. This concept proposes on-site detour lanes for traffic during the reconstruction of the highway. It is proposed to reconstruct SR 41 as a two lane road on a five lane rural right-of-way width, which requires right-of-way width of 200 ft. Design speed is 55 mph.

PDP Classification: Major___X____ Minor_____

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

Functional Classification:
SR 41 - Rural Minor Arterial
Juke Line Road – Rural Local Road

US Route Number(s): 27 Alt. **State Route Number(s):** 41

Traffic (AADT) as shown in the approved concept:

Current Year: (1996) 3,250 Design Year: (2016) 5,050

Proposed features to be revised:

1. The approved Concept Report proposes a permanent railroad detour with a new railroad bridge, which is approximately 195' long and requires the reconstruction of 4,700 linear ft. of track.
2. The approved concept proposes to reconstruct SR 41 as a two lane road on a five-lane rural right-of-way width of 200' minimum.
3. The approved concept proposes a typical two-lane rural roadway section with 4:1 foreslope, 4-ft. ditch, and 2:1 back slopes.
4. The approved concept proposed a design speed of 55 mph for SR 41.
5. The approved concept proposes on-site detour lanes for the traffic during the reconstruction of the proposed SR 41 and construction of the proposed permanent railroad bridge.

Describe the revised feature(s) to be approved:

1. It is recommended to construct a temporary railroad detour with a 50 ft. long temporary bridge south of the existing railroad track, which would require 1,554 ft. of new track and shifting of 434 ft. of existing track on the east end and 408 ft. of existing track on the west end. A temporary railroad detour is recommended because the railroad is designated as a historic resource. The existing railroad bridge is individually eligible for listing as historic place, so its removal would be a Section 4(f) impact. However, GDOT and FHWA have a "Programmatic Section 4(f) for Historic Bridges" available for use. The Programmatic Section 4(f) does not require "legal sufficiency" review, and will not automatically elevate the environmental document to an Environmental Assessment the way that a regular Section 4(f) impact would. However, SHPO has set precedent and considers the permanent relocation of a historic railroad alignment as an adverse effect. This would trigger Section 4(f) and Department does not allow a project to be processed with a Categorical Exclusion if regular Section 4(f) Evaluation is required. Elevating the document to an Environmental Assessment can add approximately 12 to 18 months to the project schedule. In addition, there is no Programmatic Section 4(f) Agreement for historic railroads. Thus instead of permanent realignment of the railroad, a temporary detour has been proposed to

maintain railroad traffic during construction of the proposed bridge on the existing railroad alignment while minimizing impacts to the historic resource.

2. It is recommended to reduce the right-of-way width to that of a two lane rural roadway of 100'. Design year traffic projections do not warrant widening to a five lane rural section. The reduced scope will also avoid large scale property impacts and environmental impacts to the waters of the US.
3. It is recommended a combination of typical two-lane rural section and two-lane section with v-gutter to be used in the project. The revised typical sections will be used to minimize environmental impacts to open waters and streams and achieve a good drainage system. In addition, use of 2:1 foreslope where possible will avoid or minimize any right-of-way and environmental impacts.
4. It is recommended using a design speed of 45 mph in order to minimize required length of roadway to be constructed for tie-in of the proposed SR 41 with the existing alignment. The reduced scope will significantly reduced cost of construction, right-of-way impacts, and environmental impacts.
5. It is recommended using a combination of temporary construction staging and off-site detour of 5.50 miles to maintain traffic during construction. Since the proposed bridge is to be constructed on the existing alignment and the proposed SR 41 is to be lowered by approximately 6.5 ft. near the proposed bridge location, the existing roadway must be closed to through traffic during construction of that portion of the project.

Updated traffic data (AADT):

Current Year: (2006) 3,400 Design Year: (2029) 6,100

Programmed Schedule:

P.E.: 2009 R/W: Long Range Construction: Long Range

VE Study Required Yes( ) No(X)

Revised Cost Estimates:

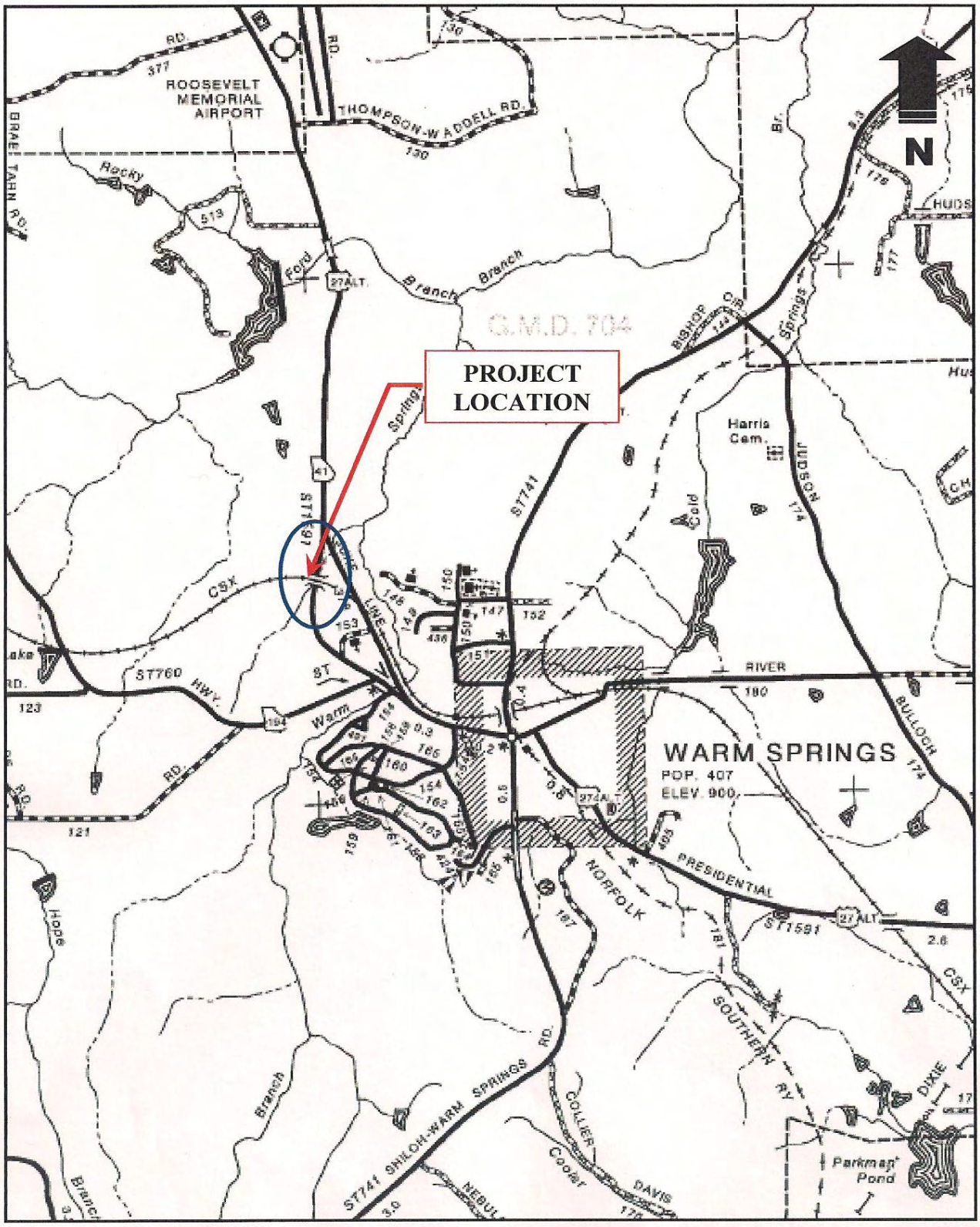
1. Construction cost including ~~inflation~~ & E&C: ~~$6,426,387~~ $6,870,391
2. Right-of-way: $696,800
3. Reimbursable Utilities: $32,000

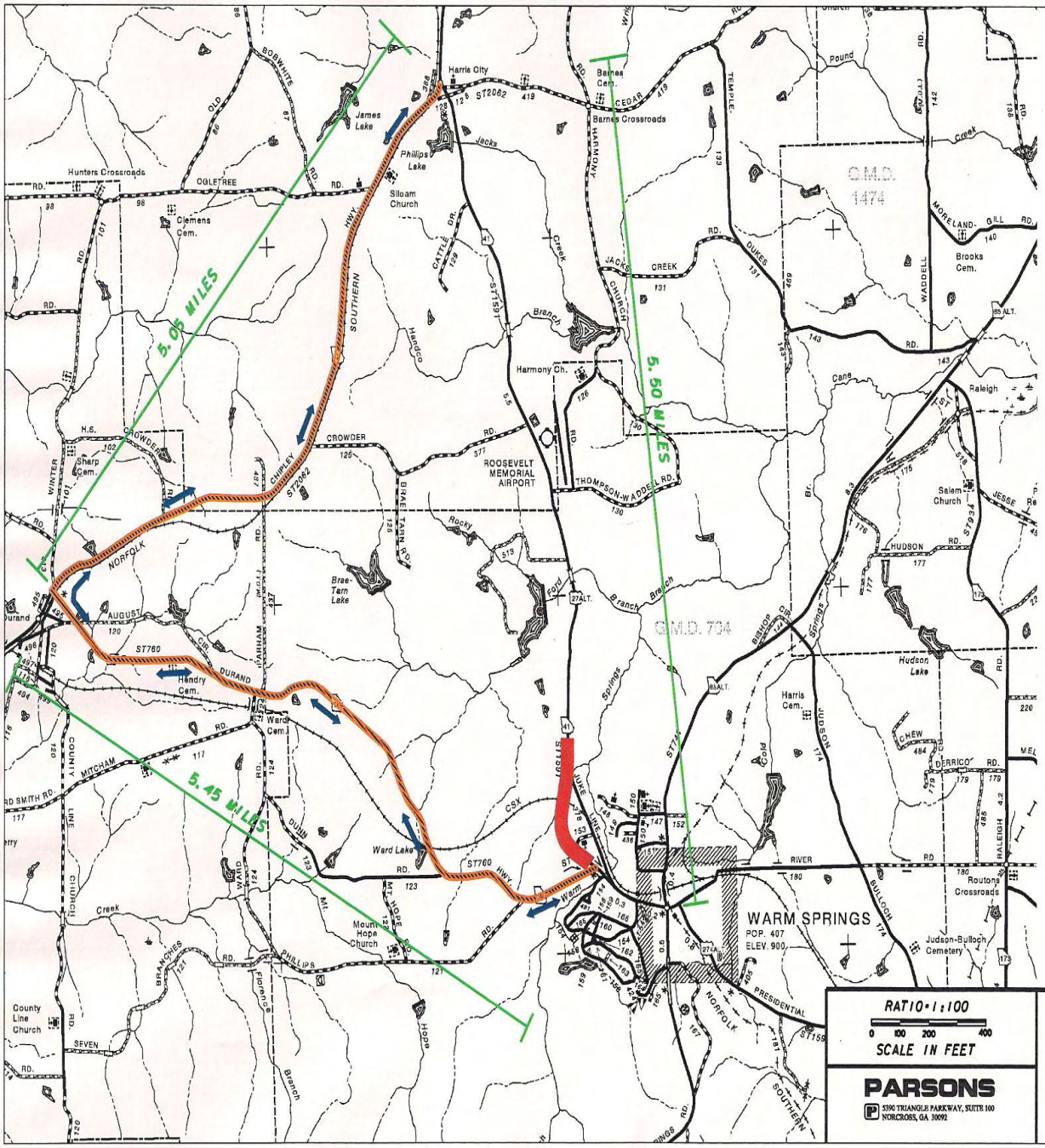
Is the project located in a Non-attainment area? No

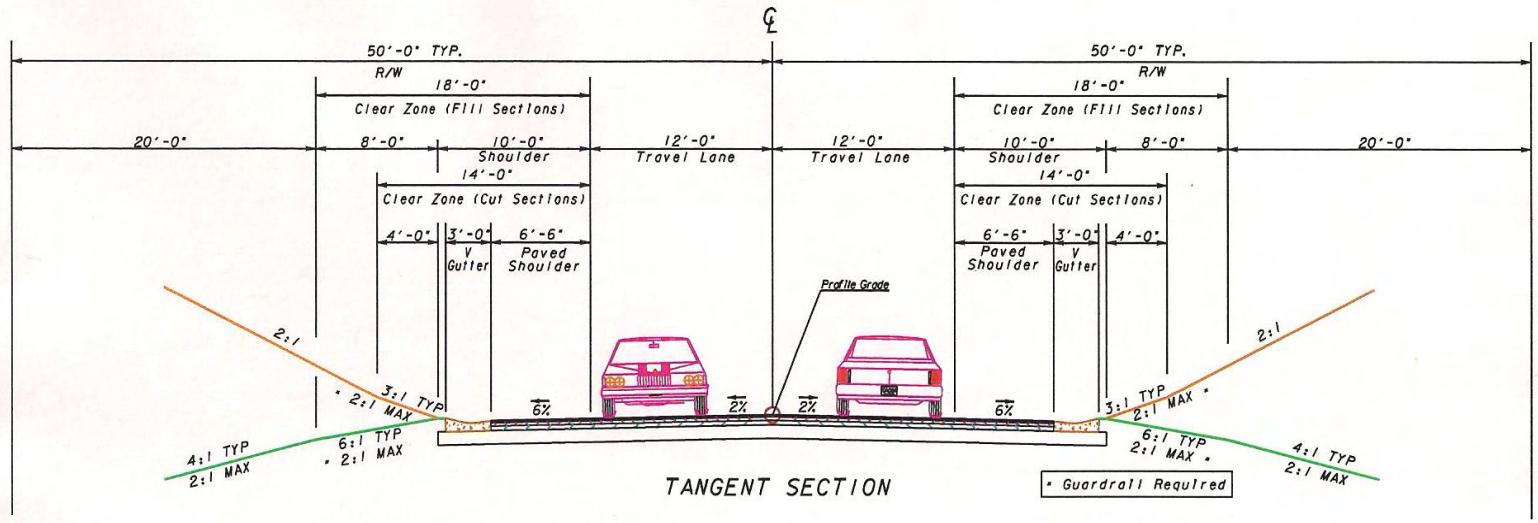
Recommendation:

We recommend that the proposed revisions to the concept be approved for implementation.

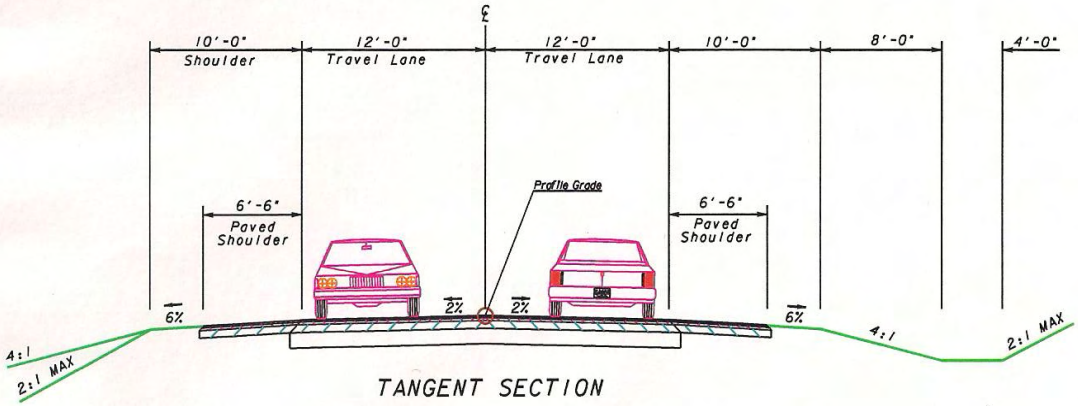
FIGURE 1.1: PROJECT LOCATION MAP
STP-159-1(14) MERIWETHER COUNTY
P.I. NO. 321880




5.05 MILES
5.50 MILES
5.45 MILES
WARM SPRINGS
POP. 407
ELEV. 900
ROOSEVELT MEMORIAL AIRPORT
G.M.D. 1474
G.M.D. 734
Harris City
Barnes Cem.
Barnes Crossroads
Hunters Crossroads
Clemens Cem.
James Lake
Phillips Lake
Siloam Church
Harmony Ch.
Brae Tarn Lake
Sharp Cem.
Hendry Cem.
Ward Cem.
Ward Lake
Mount Hope Church
County Line Church
Brooks Cem.
Raleigh
Salem Church
Hudson Lake
Harris Cem.
Routons Crossroads
Judson-Bullock Cemetery
Durand
ST760
ST2062
ST1597
ST1591
ST1594
ST1594
ST1159
NORFOLK SOUTHERN
CSX
RIVER
PRESIDENTIAL
THOMPSON-WADDELL RD.
CROWDER
AUGUST
DURAND
MITCHAM
PHILLIPS
SEVEN
HUDSON
DERRICO
CHEW
MORELAND-GILL RD.
WADDELL
JUDSON
BULLOCH
RALEIGH
TRAFFIC FLOW
DETOUR ROUTE
PROJECT LIMITS
N
NOTE:
1. DETOUR ROUTE = 5.45 (SR 194)
= 5.05 (SR 18)
TOTAL DETOUR LENGTH = 10.50 MILES
2. SR 41 ROUTE TO BE DETOURED
LENGTH = 5.50 MILES
RATIO=1:100
0 100 200 400
SCALE IN FEET
PARSONS
5390 TRIANGLE PARKWAY, SUITE 100
NORCROSS, GA 30092
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
SR 41 UNDER CSX RAILROAD
DETOUR PLAN



TANGENT SECTION



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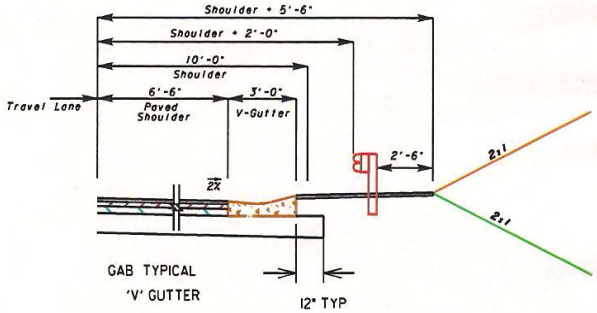
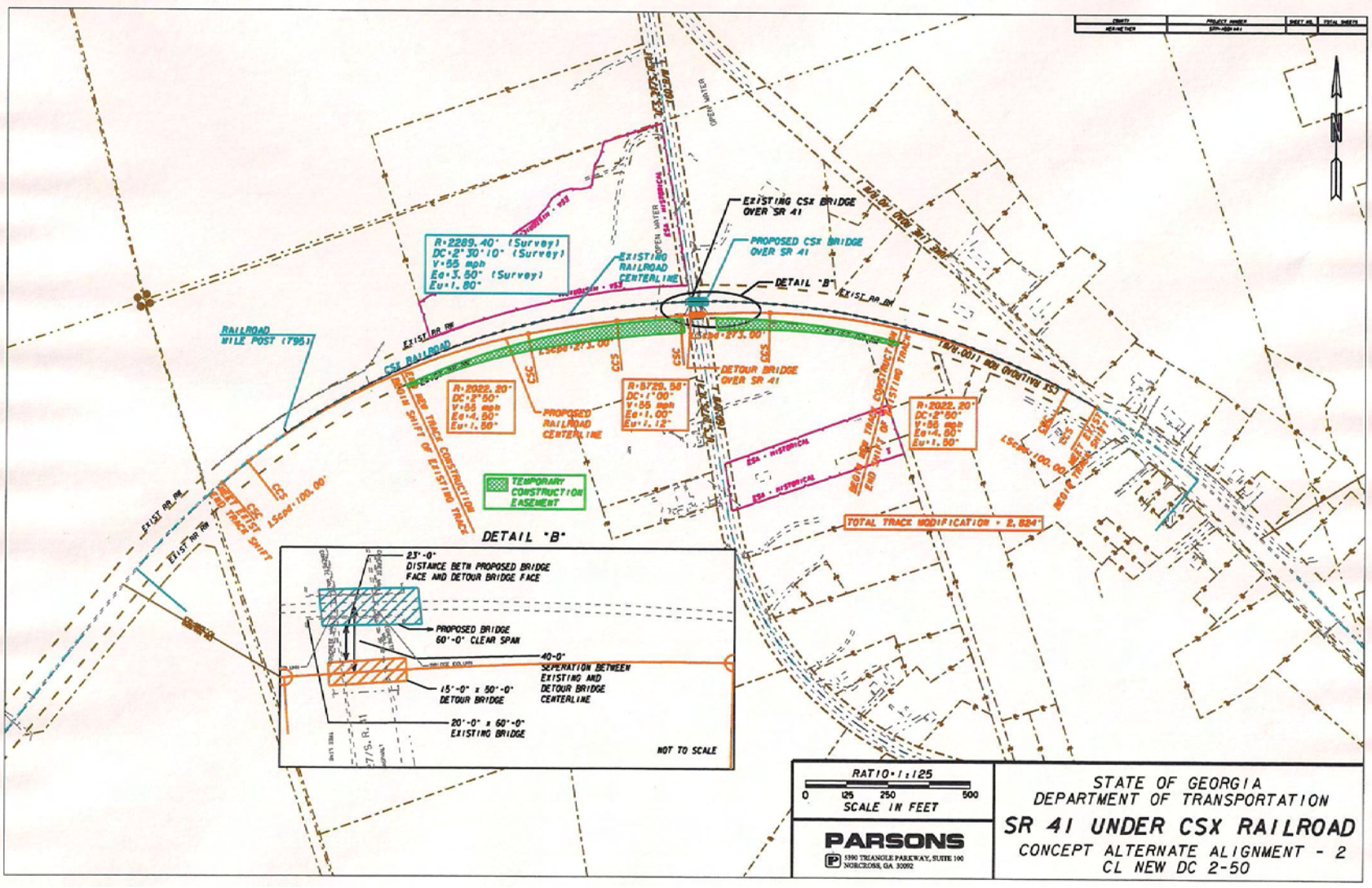
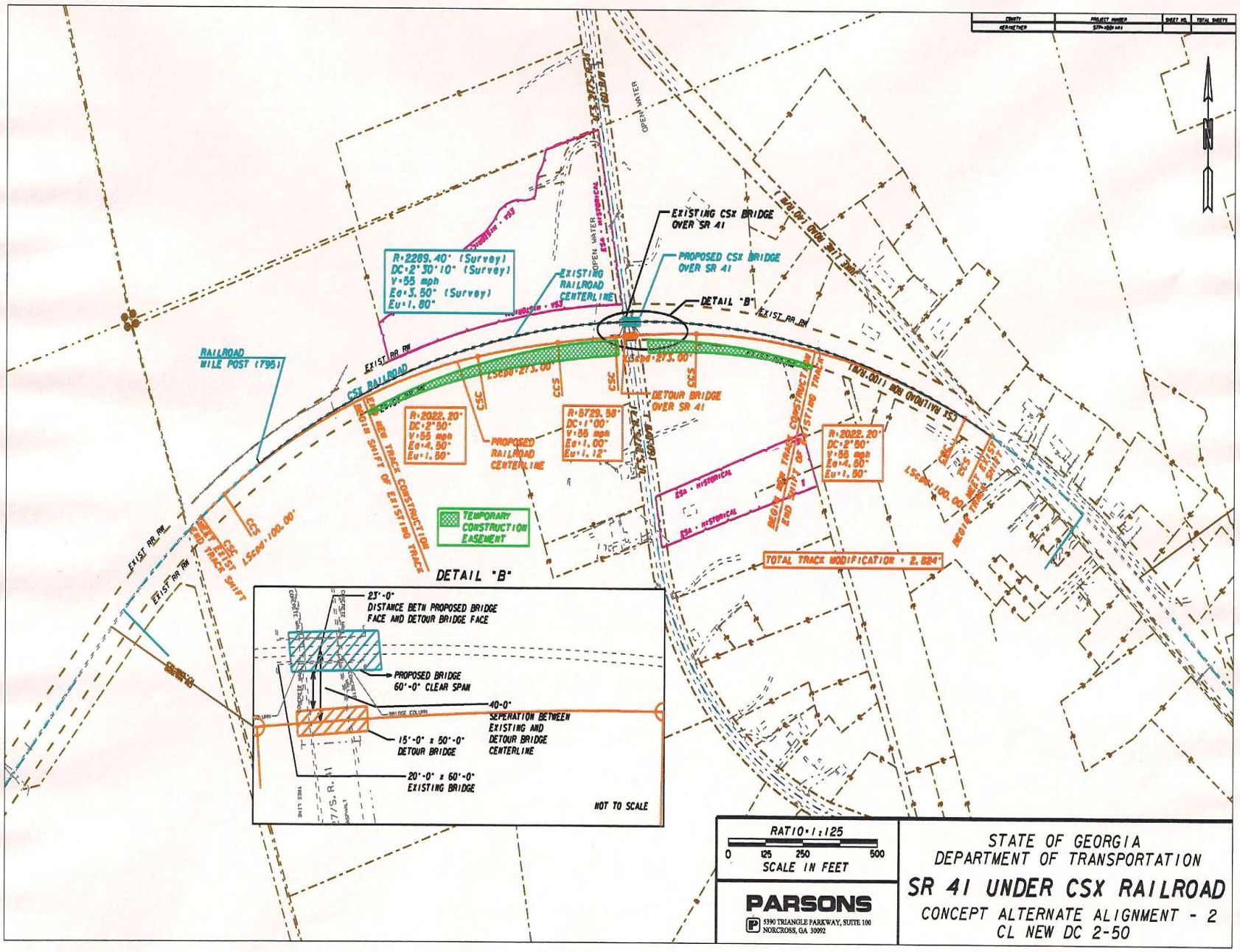
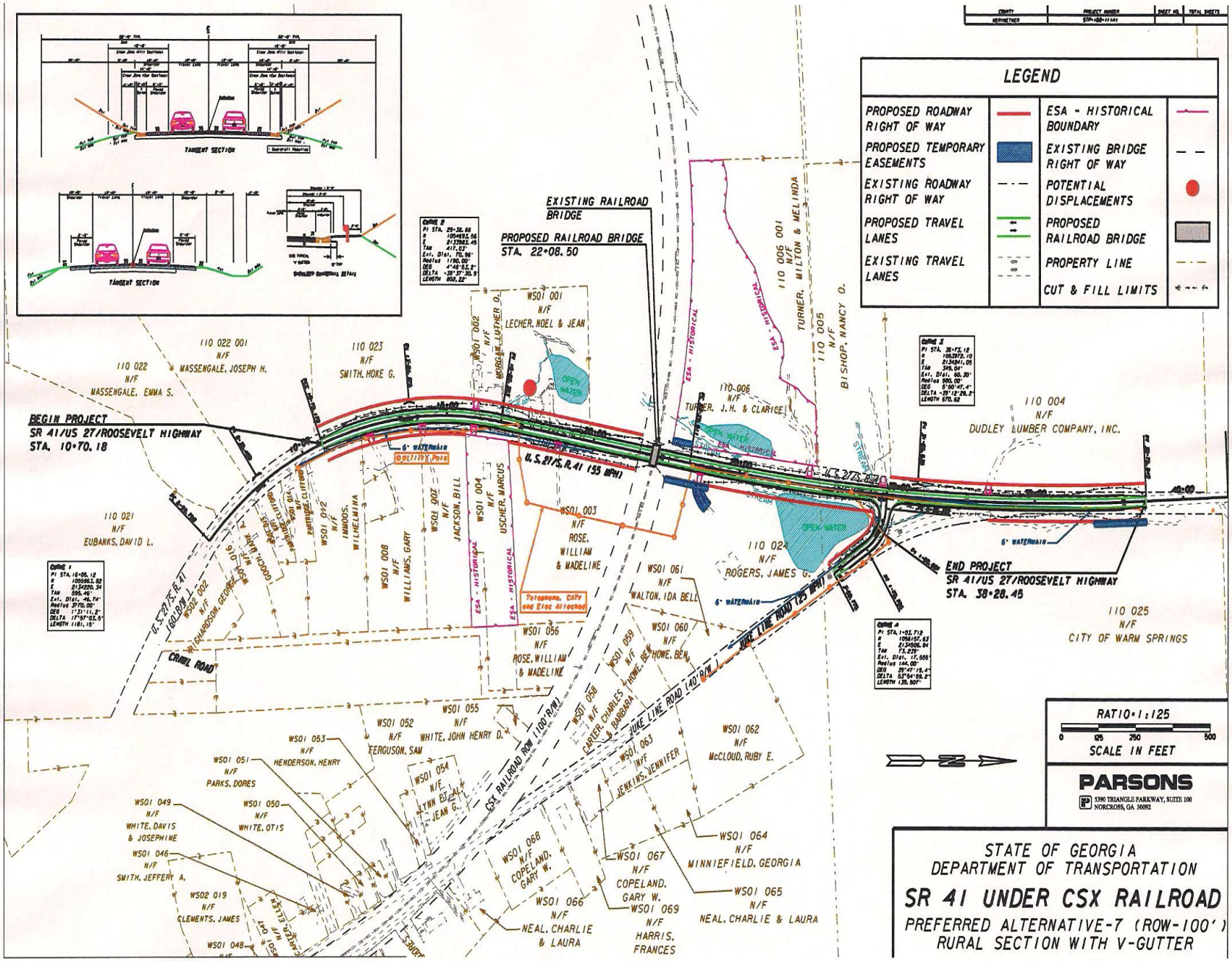


SHOULDER GUARDRAIL DETAIL


EXISTING CSX BRIDGE OVER SR 41
PROPOSED CSX BRIDGE OVER SR 41
DETAIL "B"
R=2289.40' (Survey)
DC=2°30'10" (Survey)
V=55 mph
Ea=3.50" (Survey)
Eu=1.80"
EXISTING RAILROAD CENTERLINE
RAILROAD MILE POST (795)
CSX RAILROAD
EXIST RR RW
DETOUR BRIDGE OVER SR 41
R=2022.20'
DC=2°50'
V=55 mph
Ea=4.50"
Eu=1.50"
PROPOSED RAILROAD CENTERLINE
R=5729.58'
DC=1°00'
V=55 mph
Ea=1.00"
Eu=1.12"
TEMPORARY CONSTRUCTION EASEMENT
TOTAL TRACK MODIFICATION = 2,834'
DETAIL "B"
23'-0" DISTANCE BETW PROPOSED BRIDGE FACE AND DETOUR BRIDGE FACE
PROPOSED BRIDGE 60'-0" CLEAR SPAN
40'-0" SEPERATION BETWEEN EXISTING AND DETOUR BRIDGE CENTERLINE
15'-0" x 50'-0" DETOUR BRIDGE
20'-0" x 60'-0" EXISTING BRIDGE
NOT TO SCALE
RATIO=1:125
0 125 250 500
SCALE IN FEET
PARSONS
5390 TRIANGLE PARKWAY, SUITE 100
NORCROSS, GA 30092
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
SR 41 UNDER CSX RAILROAD
CONCEPT ALTERNATE ALIGNMENT - 2
CL NEW DC 2-50


EXISTING CSX BRIDGE OVER SR 41
PROPOSED CSX BRIDGE OVER SR 41
DETAIL "B"
EXIST RR RW
R=2289.40' (Survey)
DC=2°30'10" (Survey)
V=55 mph
Ea=3.50" (Survey)
Eu=1.80"
EXISTING RAILROAD CENTERLINE
RAILROAD MILE POST (795)
CSX RAILROAD
LSCD=273.00'
DETOUR BRIDGE OVER SR 41
R=2022.20'
DC=2°50'
V=55 mph
Ea=4.50"
Eu=1.50"
PROPOSED RAILROAD CENTERLINE
R=8729.58'
DC=1°00'
V=55 mph
Ea=1.00"
Eu=1.12"
TEMPORARY CONSTRUCTION EASEMENT
LSCD=100.00'
TOTAL TRACK MODIFICATION = 2,624'
DETAIL "B"
23'-0" DISTANCE BETN PROPOSED BRIDGE FACE AND DETOUR BRIDGE FACE
PROPOSED BRIDGE 60'-0" CLEAR SPAN
40-0" SEPERATION BETWEEN EXISTING AND DETOUR BRIDGE CENTERLINE
15'-0" x 50'-0" DETOUR BRIDGE
20'-0" x 60'-0" EXISTING BRIDGE
NOT TO SCALE
RATIO=1:125
0 125 250 500
SCALE IN FEET
PARSONS
5390 TRIANGLE PARKWAY, SUITE 100
NORCROSS, GA 30092
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
SR 41 UNDER CSX RAILROAD
CONCEPT ALTERNATE ALIGNMENT - 2
CL NEW DC 2-50


LEGEND
PROPOSED ROADWAY RIGHT OF WAY
PROPOSED TEMPORARY EASEMENTS
EXISTING ROADWAY RIGHT OF WAY
PROPOSED TRAVEL LANES
EXISTING TRAVEL LANES
ESA - HISTORICAL BOUNDARY
EXISTING BRIDGE RIGHT OF WAY
POTENTIAL DISPLACEMENTS
PROPOSED RAILROAD BRIDGE
PROPERTY LINE
CUT & FILL LIMITS
EXISTING RAILROAD BRIDGE
PROPOSED RAILROAD BRIDGE STA. 22+08.50
BEGIN PROJECT
SR 41/US 27/ROOSEVELT HIGHWAY
STA. 10+70.18
END PROJECT
SR 41/US 27/ROOSEVELT HIGHWAY
STA. 38+28.45
U.S. 27/S.R. 41 (55 MPH)
U.S. 27/S.R. 41 (45 MPH)
CRAWL ROAD
DUKE LINE ROAD (40' R/W)
CSX RAILROAD ROW (100' R/W)
6" WATERMAIN
UTILITY POLE
Telephone, CATV and Elec Attached
110 022 001 N/F MASSENGALE, JOSEPH H.
110 022 N/F MASSENGALE, EMMA S.
110 023 N/F SMITH, HOKE G.
WS01 001 N/F LECHER, NOEL & JEAN
WS01 002 N/F MOBLEY, LUTHER O.
110 006 001 N/F TURNER, MILTON & MELINDA
110 005 N/F BISHOP, NANCY O.
110 006 N/F TURNER, J.H. & CLARICE
110 004 N/F DUDLEY LUMBER COMPANY, INC.
110 021 N/F EUBANKS, DAVID L.
WS01 003 N/F ROSE, WILLIAM & MADELINE
WS01 004 N/F USCHER, MARCUS
WS01 005 N/F JACKSON, BILL
WS01 008 N/F WILLIAMS, GARY
WS01 042 N/F IMMOOS, WILHELMINA
WS02 002 N/F CHANDOSON, GEORGE
WS01 061 N/F WALTON, IDA BELL
WS01 060 N/F HOWE, BEN
WS01 056 N/F ROSE, WILLIAM & MADELINE
WS01 058 N/F CARTER, CHARLES & BARBARA
WS01 059 N/F HOWE, BEN
WS01 063 N/F JENKINS, JENNIFER
WS01 062 N/F McCLOUD, RUBY E.
WS01 055 N/F WHITE, JOHN HENRY D.
WS01 052 N/F FERGUSON, SAM
WS01 054 N/F LYNN ELLEN JEAN G.
WS01 053 N/F HENDERSON, HENRY
WS01 051 N/F PARKS, DORES
WS01 050 N/F WHITE, OTIS
WS01 049 N/F WHITE, DAVIS & JOSEPHINE
WS01 046 N/F SMITH, JEFFERY A.
WS02 019 N/F CLEMENTS, JAMES
WS01 048
WS01 068 N/F COPELAND, GARY W.
WS01 066 N/F NEAL, CHARLIE & LAURA
WS01 067 N/F COPELAND, GARY W.
WS01 069 N/F HARRIS, FRANCES
WS01 064 N/F MINNIEFIELD, GEORGIA
WS01 065 N/F NEAL, CHARLIE & LAURA
110 025 N/F CITY OF WARM SPRINGS
TANGENT SECTION
RATIO: 1:125
0 125 250 500
SCALE IN FEET
PARSONS
5390 TRIANGLE PARKWAY, SUITE 100
NORCROSS, GA 30092
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
SR 41 UNDER CSX RAILROAD
PREFERRED ALTERNATIVE-7 (ROW-100')
RURAL SECTION WITH V-GUTTER

VALUE ENGINEERING PROCESS

This report summarizes the analysis and conclusions by the PBS&J Value Engineering team as they performed a VE Study during the period of August 3 through August 6, 2009 in Atlanta, Georgia, for the Georgia Department of Transportation.

INTRODUCTION

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

Les M. Thomas, PE, CVS-Life	Team Leader
Ramesh Kalvakaalva, P.E., AVS	Senior Bridge Design Engineer
Luke Clarke, PE, AVS	Senior Highway Design Engineer
Kevin Martin, Esq. AVS	Highway Construction Specialist
Randy S. Thomas, CVS	Assistant Team Leader

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

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

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

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

    - **Project Objective/Goals**

        - **Improve safety**
        - **Replace CSX bridge**
        - **Maintain historical properties**

    - **Project Basic Functions**

        - **Reduce accidents**
        - **Improve vertical and horizontal clearance**
        - **Meet standards**

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

    - **Eliminate non-functional work**
    - **Reduce construction delays**
    - **Alter bridge design**
    - **Minimize environmental impacts**
    - **Minimize property displacements**
    - **Maintain traffic access**
    - **Maintain railroad operations**

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

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

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

- Construction cost savings
- Improve value
- Maintainability

- Ability to implement the idea
- General acceptability of the alternatives
- Constructability
- Scheduling delays

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

- **Development Phase** – During this phase, the VE Team developed each of the selected design alternatives whose rating was "4" or "5" because of time constraints. If time permitted, the team will develop additional recommendations. This effort included a detailed explanation of the idea with sketches as appropriate to clarify the idea from the original concept, advantages and disadvantages, a technical explanation and an estimation of the cost and resultant savings if implemented. (see the tabbed section – Study Results)

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

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

VALUE ENGINEERING STUDY AGENDA

for
Georgia Department of Transportation
Project No. STP00-0159-01(014)
P.I. No. 321880

SR 41- Replacement of CSX Bridge over SR 41
Meriwether County

August 3-6, 2009

Pre-Workshop Activities

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

Day One

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

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

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

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

1:00-2:30 Function Analysis Phase

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

2:30-5:00 Creative Phase

- Brainstorming of alternative ideas

Day Two

8:00-10:00 Evaluation Phase

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

10:00-5:00 Development Phase

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

Day Three

8:00-5:00 Development Phase

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

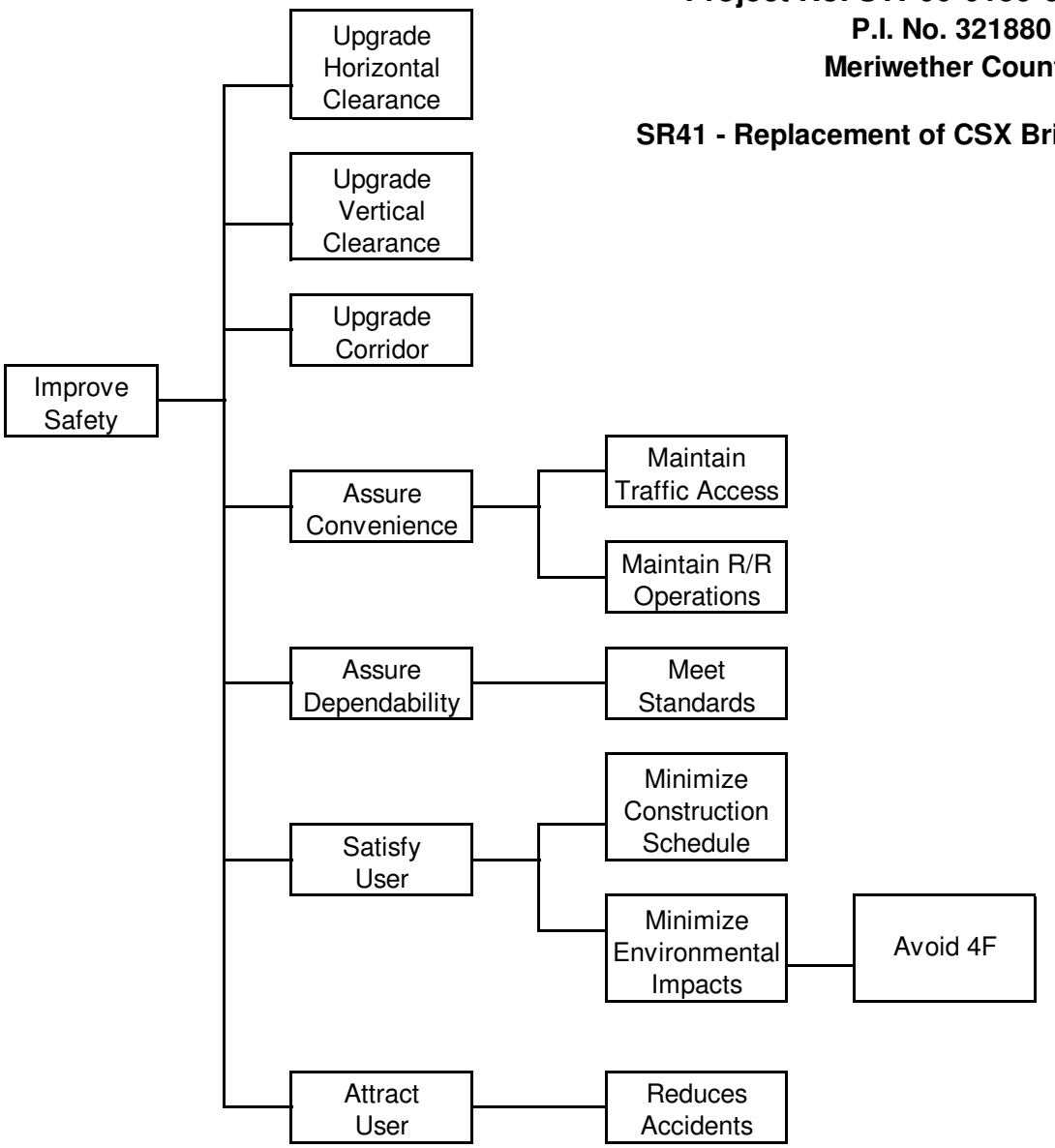
Day Four

8:00-9:00 Prepare Presentation
9:00-10:00 VE Team Presentation

CUSTOMER FUNCTION/TASK DIAGRAM

Project No. STP00-0159-01(014)
P.I. No. 321880
Meriwether County

SR41 - Replacement of CSX Bridge over SR 41

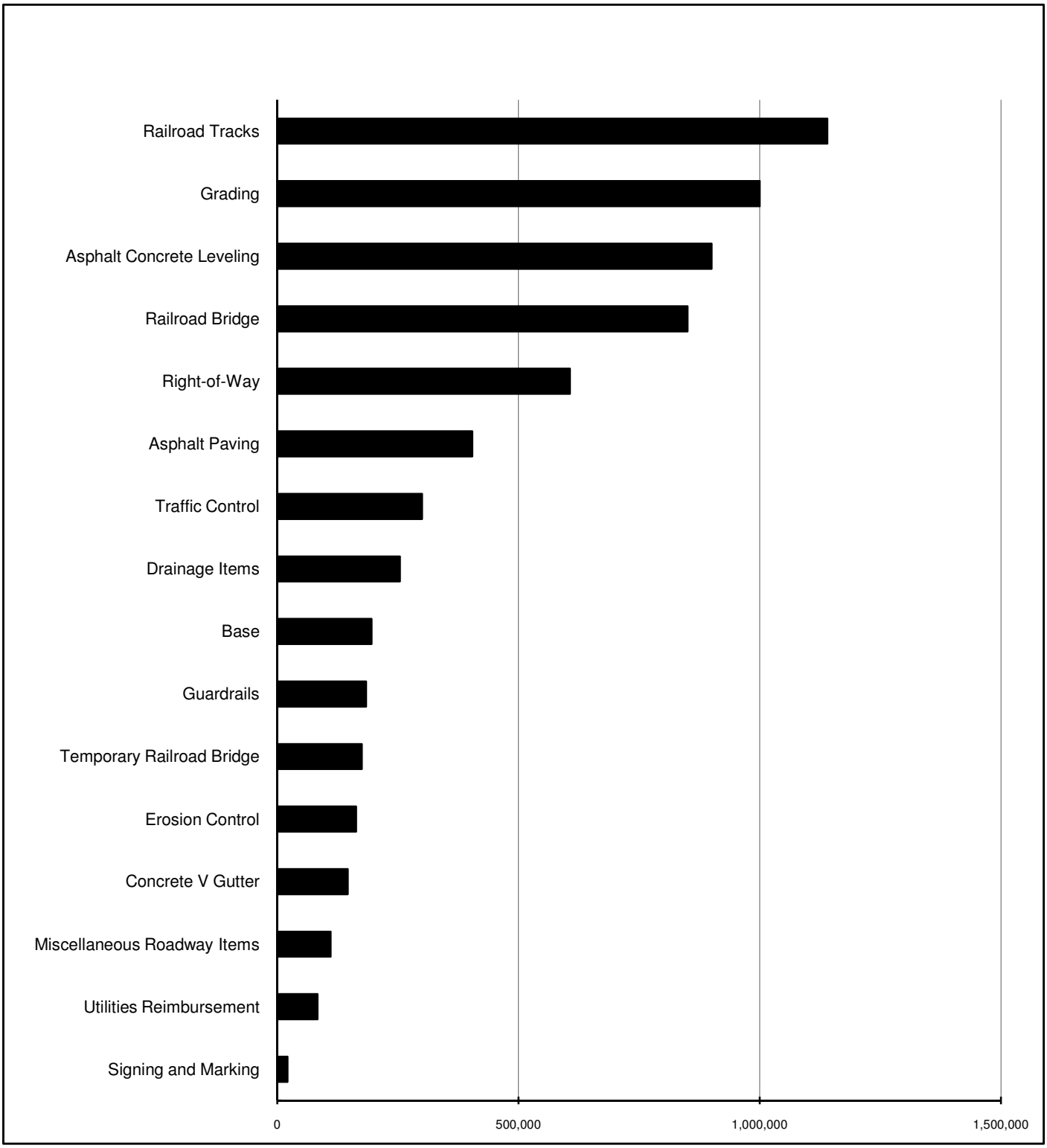


PARETO CHART - COST HISTOGRAM

PROJECT: **Georgia Department of Transportation**
STP00-0159-01(014) - P.I. No. 321880
SR 41 - Replacement of CSX Railroad Bridge over SR 41
Meriwether County

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Railroad Tracks	1,140,000	17.45%	17.45%
Grading	1,000,000	15.31%	32.76%
Asphalt Concrete Leveling	900,000	13.78%	46.54%
Railroad Bridge	850,000	13.01%	59.55%
Right-of-Way	606,500	9.29%	68.84%
Asphalt Paving	403,750	6.18%	75.02%
Traffic Control	300,000	4.59%	79.61%
Drainage Items	253,773	3.89%	83.50%
Base	195,000	2.99%	86.48%
Guardrails	184,000	2.82%	89.30%
Temporary Railroad Bridge	175,000	2.68%	91.98%
Erosion Control	163,302	2.50%	94.48%
Concrete V Gutter	145,730	2.23%	96.71%
Miscellaneous Roadway Items	110,500	1.69%	98.40%
Utilities Reimbursement	83,200	1.27%	99.68%
Signing and Marking	21,115	0.32%	100.00%
Construction Cost including ROW & Utilites	**$ 6,531,870**		
Construction Cost less ROW & Utilites	**$ 5,842,170**		
E & C Rate @10%	**$ 584,217**		
Total Construction Costs	**$ 6,426,387**		
Right-of-Way	**$ 606,500**		
Utilities Reimbursement	**$ 83,200**		
TOTAL	**$ 7,116,087**		

Project: STP00-0159-01(014}
P.I. No. 321880
Meriwether County



DESIGNER PRESENTATION

MEETING PARTICIPANTS

Geogia Department of Transportation **August 3, 2009**

STP00-0159-01(014) - P.I. No. 321880

Meriwether County

NAME	ORGANIZATION & TITLE		E-MAIL	PHONE
Lisa Myers	GDOT	GDOT - Engineering Services	lmyers@dot.ga.gov	404-631-1770
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Matt Sanders	GDOT	GDOT-Engineering Services	msanders@dot.ga.gov	404-631-1752
Ron Wishon	GDOT	GDOT-Engineering Services	rwishon@dot.ga.gov	404-631-1753
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VE TEAM PRESENTATION

MEETING PARTICIPANTS

Geogia Department of Transportation **August 6, 2009**

STP00-0159-01(014) - P.I. No. 321880

Meriwether County

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CREATIVE IDEA LISTING

PBSJ

PROJECT: **Georgia Department of Transportation**
STP00-0159-01(014) – P.I. No. 321880
SR 41 - Replacement of CSX Bridge over SR 41
Meriwether County

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

NO.	IDEA DESCRIPTION	RATING
	BRIDGE (BR)	
BR-1	Use a pre-cast, through girder in-lieu of steel I beams	3
BR-2	Use a direct rail to deck fastening system in-lieu of ballasted tracks	3
BR-3	Reduce the width of the bridge	2
BR-4	Reduce the height of ballast retention walls	2
BR-5	Minimize horizontal clearance to 48' using current bridge design	5
BR-6	Use a pre-cast arch system in-lieu of current design	2
BR-7	Modify bridge design to accommodate existing road profile	5
BR-8	Modify bridge design to accommodate future widening & existing road profile	5
	ROADWAY (RW)	
RD-1	Use an 8' shoulder with type 2 curb and gutter	4
RD-2	Use a 2' paved shoulder	2
RD-3	Use a 4' paved shoulder	2
RD-4	Increase the use of 3:1 slopes in-lieu of 2:1	3
RD-5	Use 11' lanes	2
RD-6	Reduce ROW to less that 100' where practical	2
RD-7	Build 24' curb and gutter section	2
RD-8	Close roadway and use off-site detour for all construction	2
RD-9	Minimize ROW acquisition	2
RD-10	Stop work at Sta. 32+50	3
RD-11	Minimize ROW using similar design bridge	2
RD-12	Minimize ROW per design standards	2

Rating: 1→2 = Not to be Developed; 3 = Varying Degrees of Development Potential;
4→5 = Most likely to be Developed; DS = Design Suggestion; ABD = Already Being Done; OB= Observation