VALUE ENGINEERING CONSTRUCTABILITY STUDY OF THE

SR 20 PASSING/TRUCK CLIMBING LANES

PROJECT NUMBER: STP-012-1(87)

PI NUMBER: 621710

BARTOW COUNTY, GEORGIA

ATLANTA, GEORGIA

August 16-17, 2006

Prepared by:

VE GROUP, L.L.C.

In Association With:

Georgia Department of Transportation

VALUE ENGINEERING STUDY TEAM LEADER

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C.V.S. Registration No. 840603(LIFE)

Date: _____

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I. INTRODUCTION

GENERAL

This Value Engineering report summarizes the results of the Value Engineering study performed by VE GROUP for the Georgia Department of Transportation. The study was performed on August 16-17, 2006.

VALUE ENGINEERING METHODOLOGY

The Value Engineering Team followed the basic Value Engineering procedure for conducting this type of analysis.

This process included the following phases:

1. Investigation
2. Speculation
3. Evaluation/Development
4. Report Preparation

Evaluation criteria identified as a basis for the comparison of alternatives included the following:

- Construction time
- Ease of construction
- Environmental Impacts
- Construction Cost

I. INTRODUCTION

SUMMARY OF RECOMMENDATIONS

It is the recommendation of the Value Engineering Team that the following Value Engineering Alternatives be carried into the Project Development process for the final plans and specifications.

I. CONSTRUCTABILITY

RECOMMENDATION NUMBER 1:

A. RETAINING WALLS

The Value Engineering Team recommends that the Value Engineering Alternative be implemented***. The Value Engineering Alternative eliminates any conflicts between the new walls and the existing pipes and uses a different type of wall.***

If this recommendation can be implemented, there is a possible savings of ***$1,423,126.***

RECOMMENDATION NUMBER 2:

B. JUNCTION BOX

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***The Value Engineering Alternative uses a driveway type cross drain.***

If this recommendation can be implemented, there is a possible savings of ***$ 4,235.***

RECOMMENDATION NUMBER 3:

C. ROBERTSON DR./HOLLY DR. REALIGNMENT

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***The Value Engineering Alternative realigns Holly Drive only.***

If this recommendation can be implemented, there is a possible savings of ***$ 299,825.***

II. TRAFFIC CONTROL

RECOMMENDATION NUMBER 4:

A. TEMPORARY BARRIER

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***The Value Engineering Alternative eliminates where possible.***

If this recommendation can be implemented, there is a possible savings of ***$ 222,250.***

SUMMARY OF RECOMMENDATIONS *(continued)*

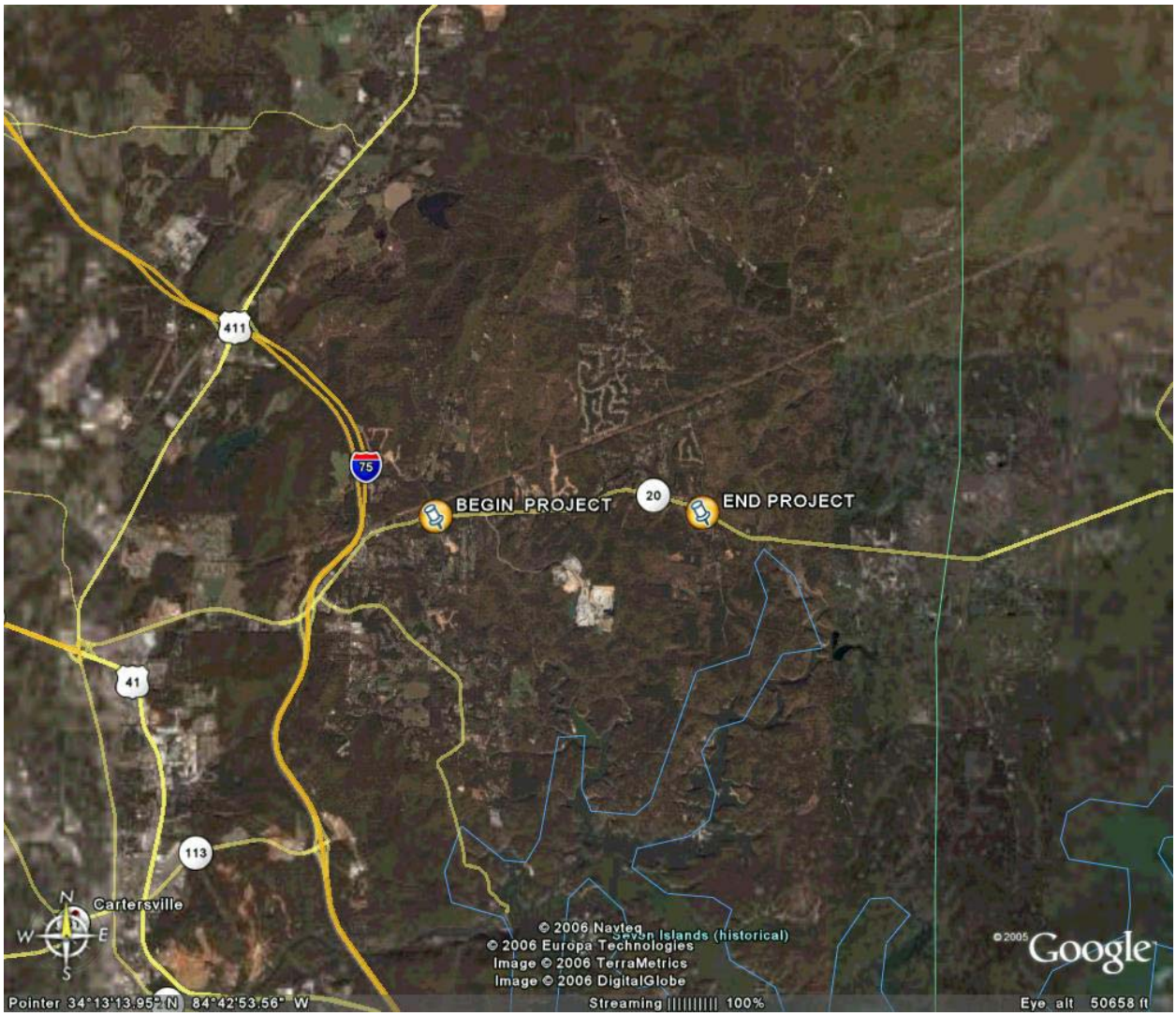
III. CONSTRUCTION TIME

RECOMMENDATION NUMBER 5

A. LENGTH OF TIME

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***The Value Engineering Alternative establishes time based on wall construction.***

II. LOCATION OF PROJECT



III. TEAM MEMBERS AND PROJECT DESCRIPTION

TEAM MEMBERS

NAME	AFFILIATION	EXPERTISE	PHONE
William F. Ventry, P.E., C.V.S.	VE Group	Team Leader	850/627-3900
Bruce Nicholson	VE Group	Construction	850-627-3900
Tom Hartley, P.E., C.V.S.	VE Group	Roadway Design/Traffic	850/627-3900
John Ledbetter, Jr., P.E., R.L.S.	VE Group	Structures	850/627-3900

PROJECT DESCRIPTION

The project consists of a series of passing lanes and truck climbing lanes on SR 20 between MP 17.8 and MP 21.95. An eastbound passing lane from the end of the 4-lane section at I-75 (MP 17.8) to the Vulcan Quarry entrance (MP 19.3) would be striped out before the Vulcan Quarry entrance and would be striped as a right turn lane into the quarry. A westbound truck climbing lane from the end of the 4-lane section at I-75 (MP 17.8) to the Vulcan Quarry entrance (MP 19.3) would also include turn lanes at the intersection of the SR 20 and Rowland Springs Road. There will also be an Eastbound truck climbing lane from MP 19.3 to MP 20.75. The westbound passing lane from MP 20.75 to MP 21.95 would improve sight distance at CR 634 and add turn lanes at the intersection of SR 20 and CR 634.

IV. INVESTIGATION PHASE

VALUE ENGINEERING STUDY BRIEFING

SR 20 PASSING/TRUCK CLIMBING LANES August 16-17, 2006		
NAME	AFFILIATION	PHONE
William F. Ventry, P.E., C.V.S.	VE Group	850/627-3900
Bruce Nicholson	VE Group	850/627-3900
Tom Hartley, P.E., C.V.S.	VE Group	850/627-3900
John Ledbetter, Jr., P.E., R.L.S.	VE Group	850/627-3900
David Moore	D-6 Design	770/387-3622
Steve Malinak	D-6 Design	770/387-3626
Dawn Farist	D-6 Design	770/387-3626
Lonnie Jones	GO Construction	404/656-5306
Jenny Harris-Dunham	Bridge	404/656-5198
Ken Werho	Traffic Safety & Design	404/635-8144
Kenny Beckworth	D-6 Construction	770/387-3611
Lisa Myers	Engineering Services	404/651-7468

STUDY RESOURCES

NAME	AFFILIATION	PHONE
Troy Paterson	GDOT	404/656-6845
Gene McKissick	GDOT	404/656-6849
Tim Mathews	GDOT	404/656-5406
Andy Casey	GDOT	404/656-5406
Joe Bailey	Tensar	800/836-7271

IV. INVESTIGATION PHASE

The following areas have been identified by the Value Engineering Team as areas of focus and investigation for the Value Engineering process:

I. CONSTRUCTABILITY

- **A. RETAINING WALLS**
- **B. JUNCTION BOX**
- **C. ROBERTSON DR./HOLLY DR. REALIGNMENT**

II. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

- **A. TEMPORARY BARRIER**

III. CONSTRUCTION TIME

- **A. LENGTH OF TIME**

V. SPECULATION PHASE

Ideas generated, utilizing the brainstorming method, for performing the functions of previously identified areas of focus.

I. CONSTRUCTABILITY

A. RETAINING WALLS

- Eliminate any conflicts between the new walls and the existing pipes.
- Use a different type of wall.

B. JUNCTION BOX

- Use a driveway type cross drain.

C. ROBERTSON DR./HOLLY DR. REALIGNMENT

- Realign Holly Drive only.

II. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

A. TEMPORARY BARRIER

- Eliminate temporary barriers where possible.

III. CONSTRUCTION TIME

A. LENGTH OF TIME

- Establish time based on wall construction.

VI. EVALUATION PHASE

A. ALTERNATIVES

The following alternatives were formulated during the "eliminate and combine" portion of the Evaluation/Development Phase.

I. CONSTRUCTABILITY

A. RETAINING WALLS

Value Engineering Alternative: ***Eliminate any conflicts between the new walls and the existing pipes and use a different type of wall.***

B. JUNCTION BOX

Value Engineering Alternative: ***Use a driveway type cross drain.***

C. ROBERTSON DR./HOLLY DR. REALIGNMENT

Value Engineering Alternative: ***Realign Holly Drive only.***

II. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

A. TEMPORARY BARRIER

Value Engineering Alternative: ***Eliminate temporary barriers where possible.***

III. CONSTRUCTION TIME

A. LENGTH OF TIME

Value Engineering Alternative: ***Establish time based on wall construction.***

VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

A. RETAINING WALLS

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

B. JUNCTION BOX

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

C. ROBERTSON DR./HOLLY DR. REALIGNMENT

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

II. TRAFFIC CONTROL

A. TEMPORARY BARRIER

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

III. CONSTRUCTION TIME

A. LENGTH OF TIME

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

DESIGN COMMENTS

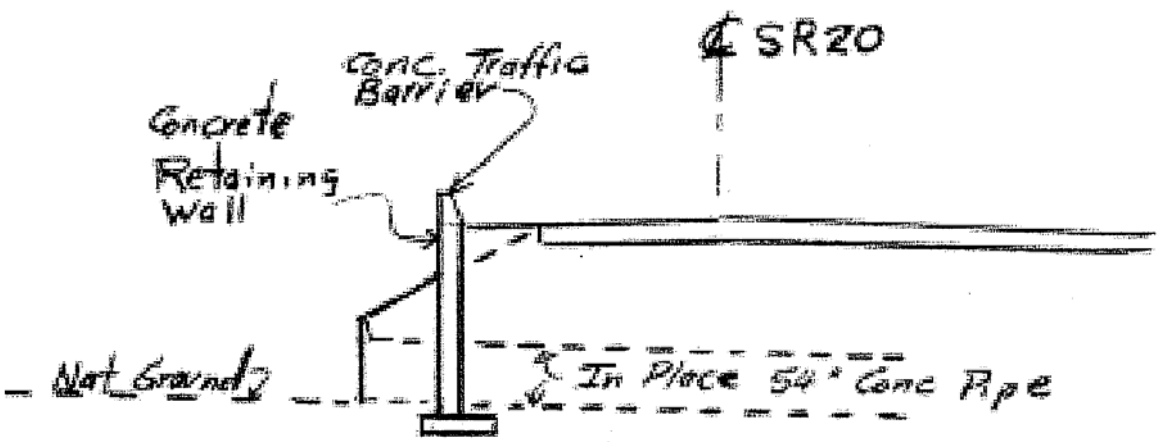
VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

A. RETAINING WALLS

1. "As Proposed"

The as proposed retaining walls are cast-in-place concrete, including a traffic barrier at the top of the wall. These walls are generally less than 15 ft. in height and are used to retain the embankment necessary for the proposed widening of SR 20. There are walls on both sides of SR 20. There is one wall that is exceptionally high, and it is on Roberson Dr. This wall reaches a maximum height of about 27 ft. There are several existing cross pipes that will conflict with the proposed walls, and necessitate the construction of the stem and footing around the cross pipes. This type of construction will be slow and somewhat complicated, since special formwork is required. In computing the cost of these walls the wall face area includes the traffic barrier.



VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

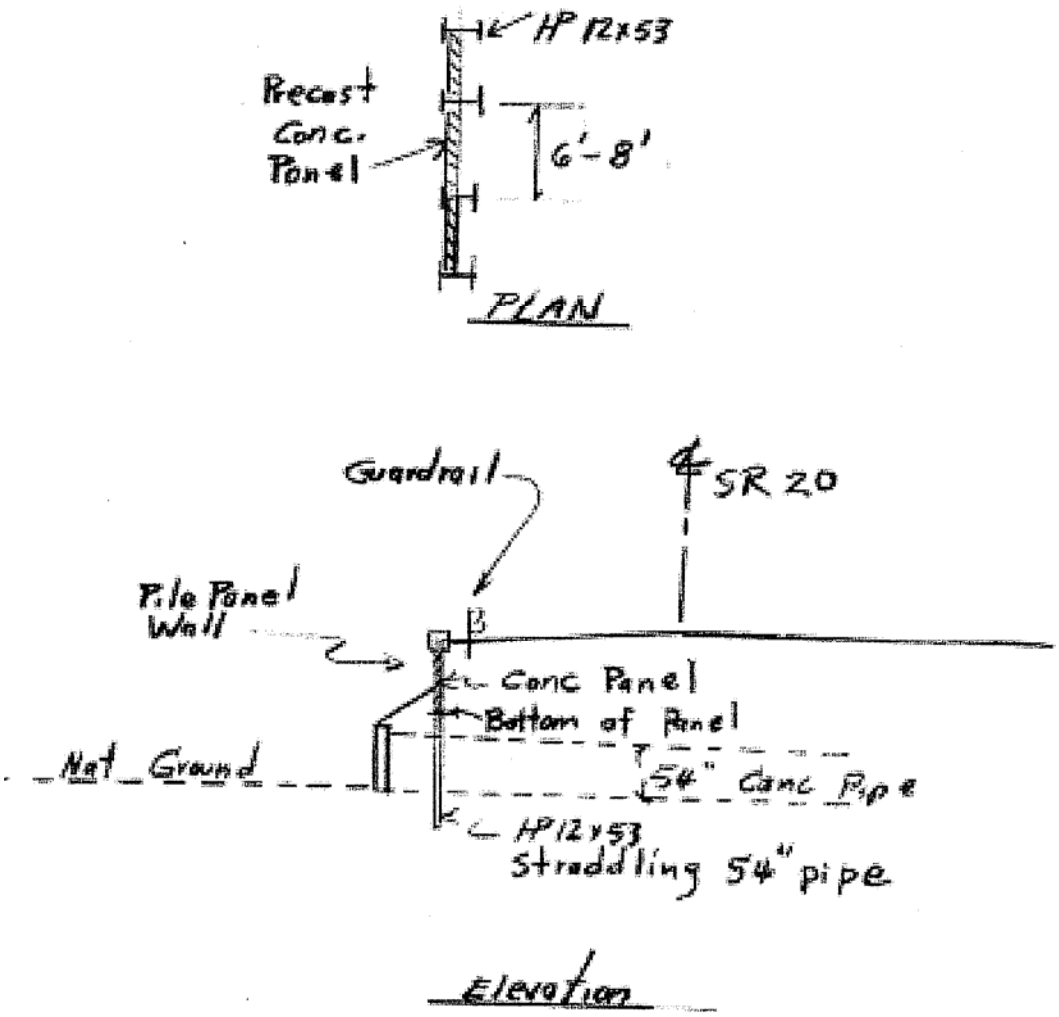
A. RETAINING WALLS

2. Value Engineering Alternative

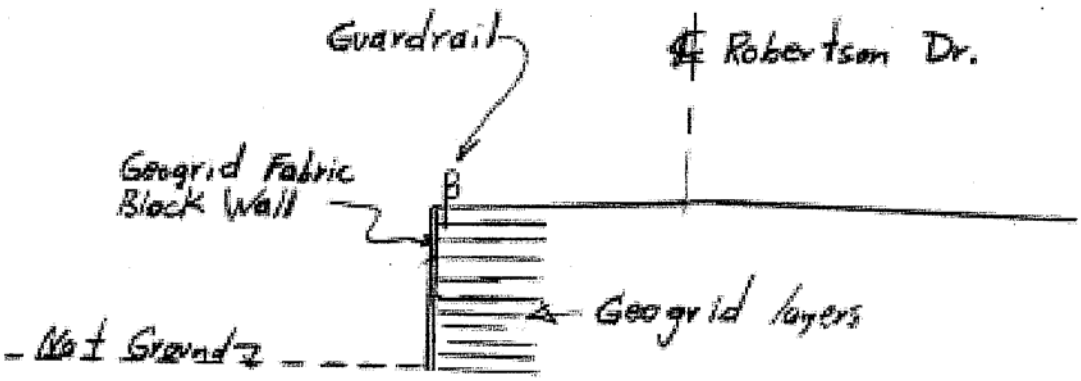
The Value Engineering Alternative consists of vertically driven HP 12x53 steel piles and precast concrete panels placed between the flanges of the piles. The piles are driven on a 6 ft. to 8 ft. spacing through pilot holes. Lengths of the piles will probably be on the order of 25 ft. to 35 ft. The pilot holes aid in plumbing the piles and maintaining alignment. The precast panel can be cast at the site in lengths of 6 ft. to 8 ft. and widths of 3 ft. to 6 ft. The panels when installed must be at least 12 inches below finished grade at the face of the wall. After the piles are driven and the panels placed, a concrete coping is cast across the top of the piles with the top of the panel embedded in the coping. This ties the piles together and adds strength to the entire wall. This type of wall requires no excavation or sheeting; so maintaining traffic is facilitated. The piles can be located to straddle the cross pipes, and the bottom of the panels placed above the top of the cross pipes; so the cross pipes are not disturbed.

The 27 ft. high wall on Roberson Dr. will be a Geogrid block wall. The geogrid is placed in horizontal layers about 12 inches to 18 inches apart and attached to the facing blocks. This is a MSE wall using HDPE grid or fabric instead of steel strips.

Guardrail is used to protect the traffic instead of a concrete barrier for both the pile panel wall and the Geogrid wall. The steel guardrail posts can be placed through the geogrid.



VE Alternative



VE Alternative

VII. DEVELOPMENT PHASE
I. CONSTRUCTABILITY
A. RETAINING WALLS
2. VALUE ENGINEERING ALTERNATIVE

VII. DEVELOPMENT PHASE
I. CONSTRUCTABILITY
A. RETAINING WALLS
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
Cut Retaining Wall @ Sta. 27 + 90 to Sta. 31 + 00	SF	$35.00	3,100.0	$108,500	0.0	$0
Excavation	CY	$50.00	1,240.0	$62,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	3,100.0	$108,500
Cut Retaining Wall @ Sta. 32 + 50 to Sta. 33 + 50	SF	$35.00	200.0	$7,000	0.0	$0
Excavation	CY	$50.00	30.0	$1,500	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	200.0	$7,000
Cut Retaining Wall @ Sta. 34 + 29 to Sta. 35 + 80	SF	$35.00	755.0	$26,425	0.0	$0
Excavation	CY	$50.00	150.0	$7,500	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	755.0	$26,425
Cut Retaining Wall @ Sta. 38 + 20 to Sta. 39 + 75	SF	$35.00	465.0	$16,275	0.0	$0
Excavation	CY	$50.00	100.0	$5,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	465.0	$16,275
Retaining Wall w/Traffic Barrier Simpson Circle	SF	$36.00	2,600.0	$93,600	0.0	$0
Excavation	CY	$50.00	0.0	$0	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	1,800.0	$63,000
Guardrail	LF	$15.00	0.0	$0	200.0	$3,000
Retaining Wall w/Traffic Barrier Sta. 92 +50 to Sta. 97 + 00	SF	$36.00	4,500.0	$162,000	0.0	$0
Excavation	CY	$50.00	1,935.0	$96,750	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	2,700.0	$94,500
SUBTOTAL page 1				**$586,550**		**$318,700**

continued

continued

VII. DEVELOPMENT PHASE
I. CONSTRUCTABILITY
A. RETAINING WALLS
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
Guardrail	LF	$15.00	0.0	$0	450.0	$6,750
Retaining Wall w/Traffic Barrier Sta. 103 + 30 to Sta. 111 + 50	SF	$36.00	9,840.0	$354,240	0.0	$0
Excavation	CY	$50.00	3,280.0	$164,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	6,560.0	$229,600
Guardrail	LF	$15.00	0.0	$0	820.0	$12,300
Retaining Wall w/Traffic Barrier Sta. 124 + 50 to Sta. 126 + 75	SF	$36.00	1,575.0	$56,700	0.0	$0
Excavation	CY	$50.00	400.0	$20,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	875.0	$30,625
Guardrail	LF	$15.00	0.0	$0	175.0	$2,625
Retaining Wall w/Traffic Barrier Sta. 129 + 00 to Sta. 134 +20	SF	$36.00	7,800.0	$280,800	0.0	$0
Excavation	CY	$50.00	520.0	$26,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	5,720.0	$200,200
Guardrail	LF	$15.00	0.0	$0	520.0	$7,800
Retaining Wall w/Traffic Barrier Sta. 189 + 00 to Sta. 192 +83	SF	$36.00	6,128.0	$220,608	0.0	$0
Excavation	CY	$50.00	766.0	$38,300	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	4,596.0	$160,860
Guardrail	LF	$15.00	0.0	$0	383.0	$5,745
Retaining Wall w/Traffic Barrier Sta. 192 + 00 to Sta. 200 +00	SF	$36.00	8,000.0	$288,000	0.0	$0
Excavation	CY	$50.00	1,600.0	$80,000	0.0	$0
SUBTOTAL page 2				**$1,528,648**		**$656,505**

continued

continued

VII. DEVELOPMENT PHASE
I. CONSTRUCTABILITY
A. RETAINING WALLS
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
Pile Panel Wall	SF	$35.00	0.0	$0	4,800.0	$168,000
Guardrail	LF	$15.00	0.0	$0	800.0	$12,000
Retaining Wall w/Traffic Barrier Sta. 198 + 50 to Sta. 206 +00	SF	$36.00	11,250.0	$405,000	0.0	$0
Excavation	CY	$50.00	0.0	$0	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	8,250.0	$288,750
Guardrail	LF	$15.00	0.0	$0	750.0	$11,250
Retaining Wall w/Traffic Barrier Sta. 224 + 50 to Sta. 233 +50	SF	$36.00	11,700.0	$421,200	0.0	$0
Excavation	CY	$50.00	900.0	$45,000	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	8,100.0	$283,500
Guardrail	LF	$15.00	0.0	$0	900.0	$13,500
Retaining Wall w/Traffic Barrier CR 775 Roberson Dr. Sta. 605 + 50 to Sta. 608 + 00	SF	$60.00	5,000.0	$300,000	0.0	$0
Excavation	CY	$50.00	0.0	$0	0.0	$0
Georgia Fabric Block MUSE Wall	SF	$25.00	0.0	$0	5,000.0	$125,000
Excavation	CY	$50.00	0.0	$0	0.0	
Guardrail	LF	$15.00	0.0	$0	250.0	$3,750
Retaining Wall w/Traffic Barrier CR 267Dean Rd Sta. 107 + 00 to Sta. 108 + 30	SF	$36.00	1,430.0	$51,480	0.0	$0
Excavation	CY	$50.00	0.0	$0	0.0	$0
Pile Panel Wall	SF	$35.00	0.0	$0	910.0	$31,850
Guardrail	LF	$15.00	0.0	$0	130.0	$1,950
SUBTOTAL page 3				**$1,222,680**		**$939,550**

continued

VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

A. RETAINING WALLS

VALUE ENGINEERING ALTERNATIVE

COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'S QTY.	PROP'S COST	VE. QTY.	V.E. COST
SUBTOTAL page 1				**$586,550**		**$318,700**
SUBTOTAL page 2				**$1,528,648**		**$656,505**
SUBTOTAL page 3				**$1,222,680**		**$939,550**
SUBTOTAL				**$3,337,878**		**$1,914,755**
MOBILIZATION **(THIS IS SUB+CONTIN. X % =)**			4.0%		4.0%	
TRAFFIC CONTROL/MOT			5.0%		5.0%	
CONTINGENCY			12.0%		12.0%	
GRAND TOTAL				**$3,337,878**		**$1,914,755**

POSSIBLE SAVINGS: $1,423,123

VII. DEVELOPMENT PHASE

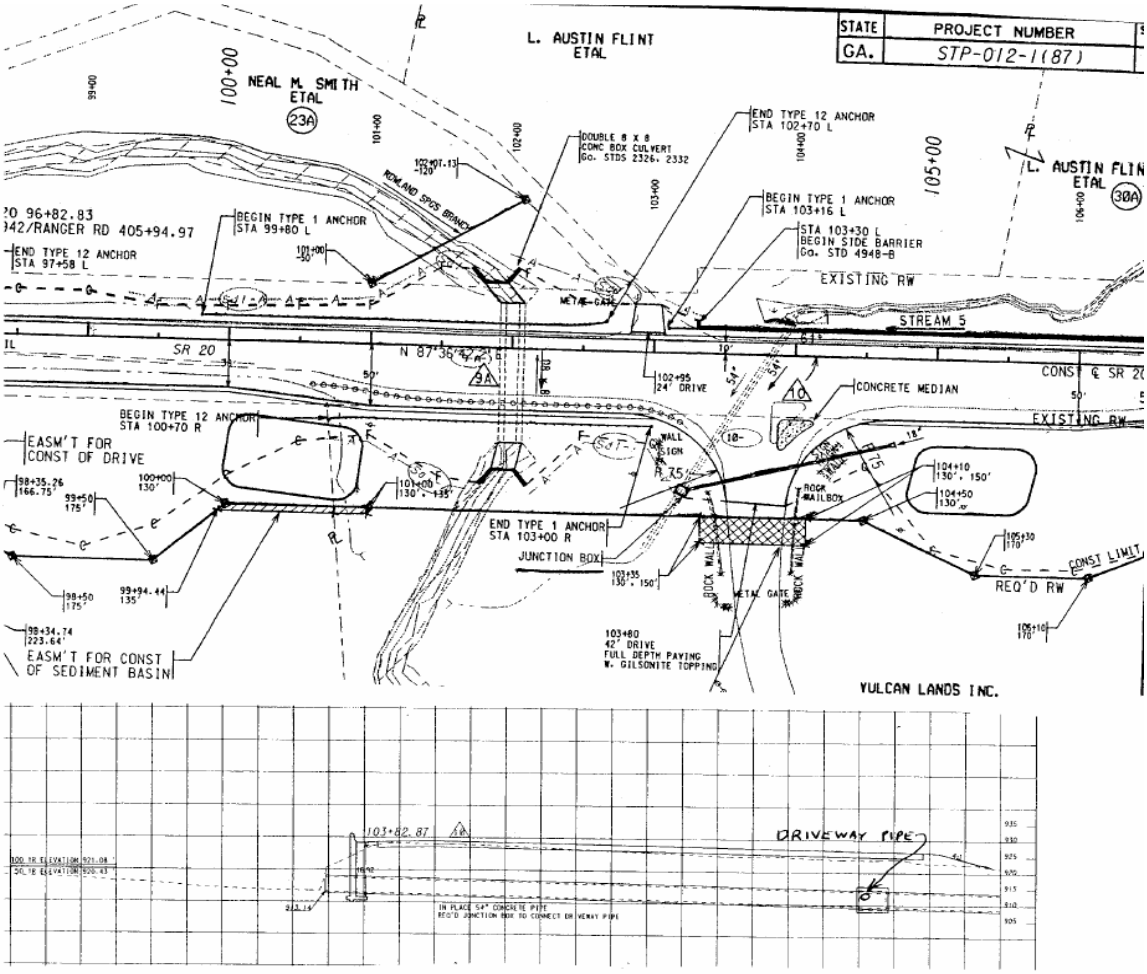
I. CONSTRUCTABILITY

B. JUNCTION BOX

1. "As Proposed"

Project STP-012-1(87) proposes to reconstruct the intersection of SR 20 with the entrance to the Vulcan Quarry. Included with this reconstruction is the placement of an 18 in. side drain pipe under the Vulcan Quarry entrance. This 18 in. pipe is proposed to intercept an existing 54 in. storm drain with the construction of a new junction box.

The proposed construction will retain all work on the proposed right-of-way. It will require cutting into the existing pipe and perhaps compromising its integrity. Below are sketches of the construction as it is proposed.



"AS PROPOSED"
JUNCTION BOX

VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

B. JUNCTION BOX

2. Value Engineering Alternative

The Value Engineering Alternative at the intersection of SR 20 and the entrance to the Vulcan Quarry is to modify the proposed drainage. It is the recommendation of the study team to eliminate the junction box and place the 18 in. side drain pipe independent of the 54 in. pipe. This proposal would add a flared end section at the outlet end and some rip rap for flow dissipation. With the drainage cross sections provided the side drain pipe could be placed above the existing 54 in. pipe.

There are many advantages to performing the work in this manner. The existing pipe is not compromised in any manner. Work on the junction box runs the risk of being performed during possible rain events. Since there would be no box under this alternative, this potential problem would not exist. The as proposed construction would take roadway water and empty it out off the right-of-way. During the time of construction, this could mean possible siltation off the right-of-way. The recommended change would also allow for much quicker construction.

The proposed junction box will be abnormally difficult to construct. The normal price for a junction box is $1710. However, this is an average price for a junction box that would be constructed during the placement of its associated pipe. This as proposed junction box would require the excavation of the existing pipe to a depth of approximately 15 ft. The pipe would have to be uncovered in such a manner as to provide access and a safe work area without shoring. The existing pipe would then have to be saw cut and a section removed. The junction box would have to be formed and poured as quickly as possible to avoid storm events. Therefore, it is the consensus of the study team that this junction box would cost approximately $5000 due to its complications.

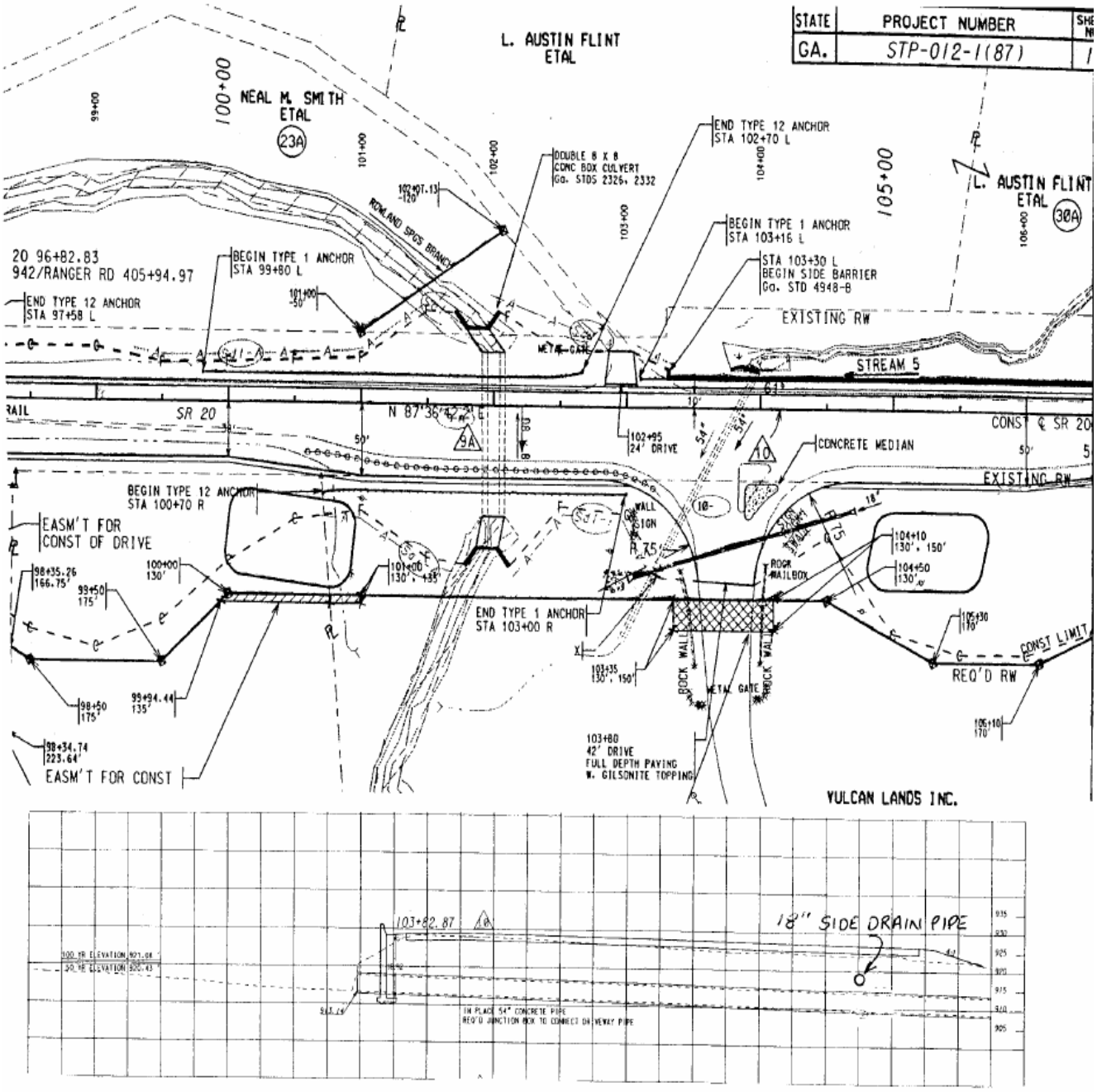
On the following page is a sketch of this Value Engineering Alternative.

VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

B. JUNCTION BOX

2. Value Engineering Alternative



VALUE ENGINEERING ALTERNATIVE
JUNCTION BOX

I. CONSTRUCTABILITY
B. JUNCTION BOX
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
54" STORM DRAIN PIPE	LF	$155	2.0	$310	0.0	$0
JUNCTION BOX	EA	$5,000	1.0	$5,000	0.0	$0
18" SIDE DRAIN PIPE	LF	$25	150.0	$3,750	170.0	$4,250
FLARED END SECTION 18"	EA	$507	1.0	$507	2.0	$1,014
STN DUMPED RIP RAP, TP 3, 12 IN	SY	$34	0.0	$0	2.0	$68
GRAND TOTAL				**$9,567**		**$5,332**

POSSIBLE SAVINGS: $4,235

VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

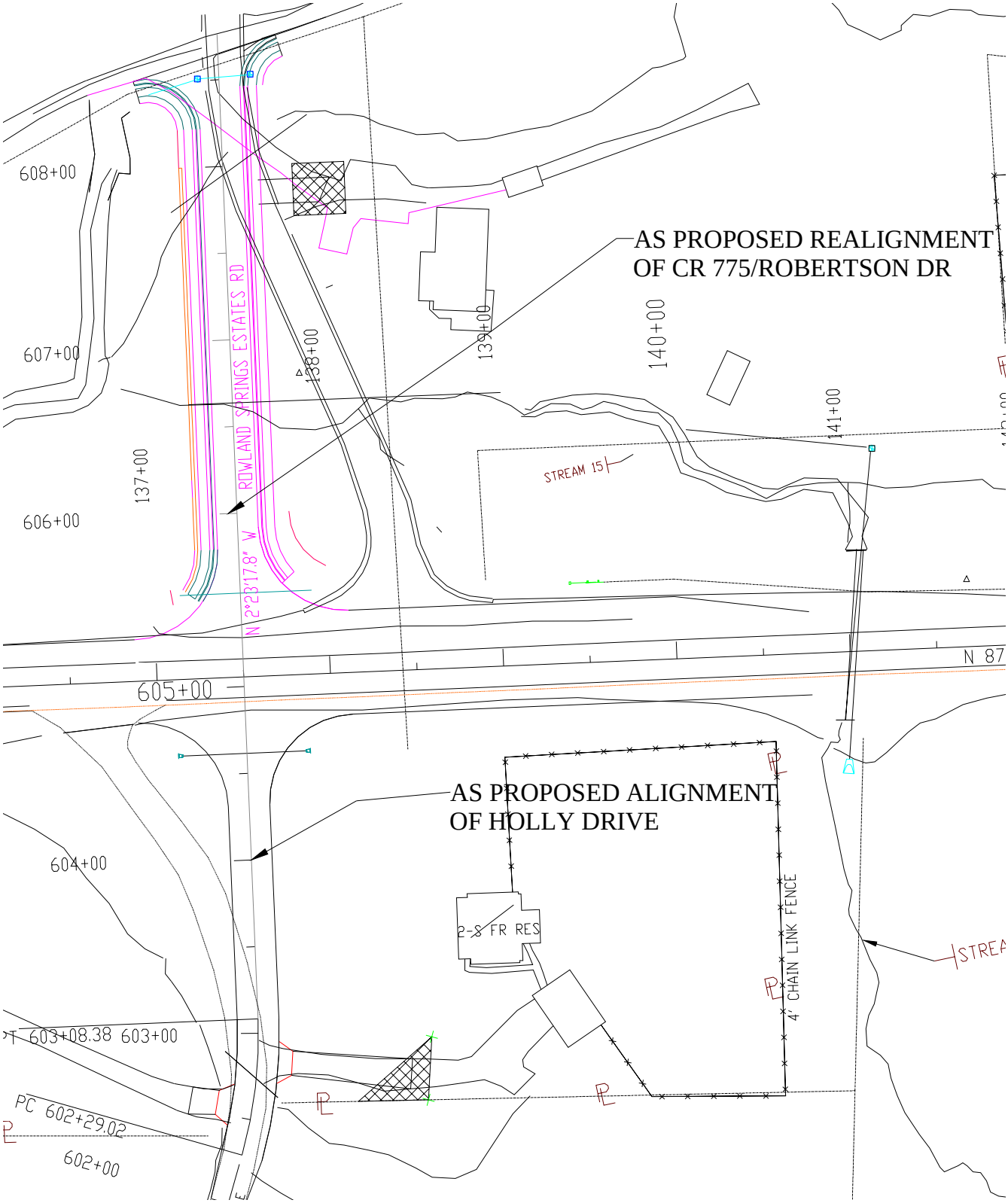
C. ROBERTSON DR./HOLLY DR. REALIGNMENT

1. "As Proposed"

The existing intersections of Holly Drive and Robertson Drive are approximately 100 ft. apart along SR 20. The current design will split that distance to relocate both roads at the same intersection. In order to accomplish this, the alignment of Robertson Drive will be shifted to the west and encroach upon Carter Creek. Holly Drive will be shifted to the east. To reduce the impacts to the creek to the west of Robertson Drive, a cast-in-place retaining wall will be constructed.

Right-of-way will have to be acquired from the Bartow Group, LLC and from William Medford Wheeler, along with driveway construction easements from William Medford Wheeler, Vincent Frias, Frank C. Dysart & Frances H. Dysart, and Chad P. Kirkendoll.

“AS PROPOSED”
REALIGNMENT OF HOLLY DRIVE



VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

C. ROBERTSON DR./HOLLY DR. REALIGNMENT

2. Value Engineering Alternative

The Value Engineering Team recommends relocating the "As Proposed" Holly Drive 50 ft. to the east in order to match up with the existing Robertson Drive intersection, which will eliminate any construction on or along Robertson Drive. The advantages of only relocating Holly Drive are:

1. Reduces right-of-way take from the Bartow Group, LLC.

2. Eliminates Construction Easement from Vincent Frias, Frank C. Dysart & Frances H. Dysart.

3. Eliminates Construction Easement from William Medford Wheeler because this would become a Whole Take.

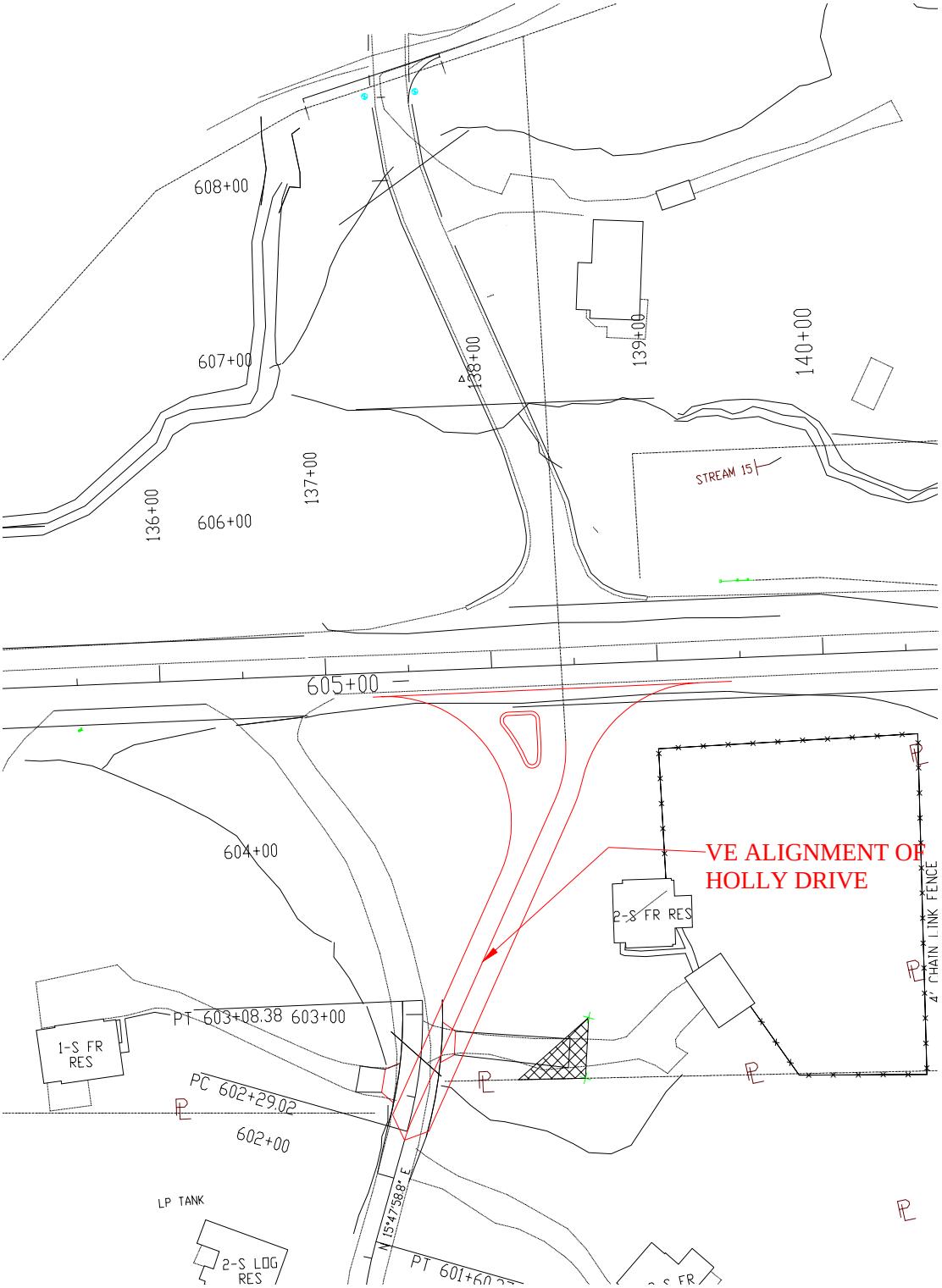
4. Eliminates need to mitigate stream impacts with a CIP retaining wall.

5. Eliminates approximately 300 ft. of roadway construction on Robertson Drive.

Right-of-way costs cannot be accurately estimated, but it would appear that the reduction in the right-of-way take from the Bartow Group, LLC and increasing the William Medford Wheeler acquisition to a whole take would be equivalent.

The major downside of this alternative will be the increase in excavation, which will increase the waste for the project.

VALUE ENGINEERING ALTERNATIVE
REALIGNMENT OF HOLLY DRIVE



I. CONSTRUCTABILITY
C. ROBERTSON DR./HOLLY DR. REALIGNMENT
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
BORROW (ROBERTSON DRIVE)	CY	$3.66	15,694	$57,440	0	$0
CUT (HOLLY DRIVE)	CY	$3.66	8,888.9	$32,534	17,351.9	$63,508
RETAINING WALL	SF	$60	5,000	$300,000	0	$0
CONCRETE SIDE BARRIER, TYPE 2	LF	$239.25	2	$479	0	$0
CONCRETE SIDE BARRIER, TYPE 2A	LF	$322.28	20	$6,446	0	$0
SIDEWALK	SY	$38.75	350	$13,563	0	$0
CURB & GUTTER	LF	$600	11.3	$6,780	0	$0
PAVEMENT	SY	$16.87	2,133.3	$35,989	1,466.7	$24,743
18” RCP	LF	$33.95	74	$2,512	0	$0
36” RCP	LF	$106.96	18	$1,925	0	$0
DROP INLETS	EA	$2,709.49	2	$5,419	0	$0
GRAND TOTAL				**$463,087**		**$88,251**

POSSIBLE SAVINGS: $374,836

VII. DEVELOPMENT PHASE

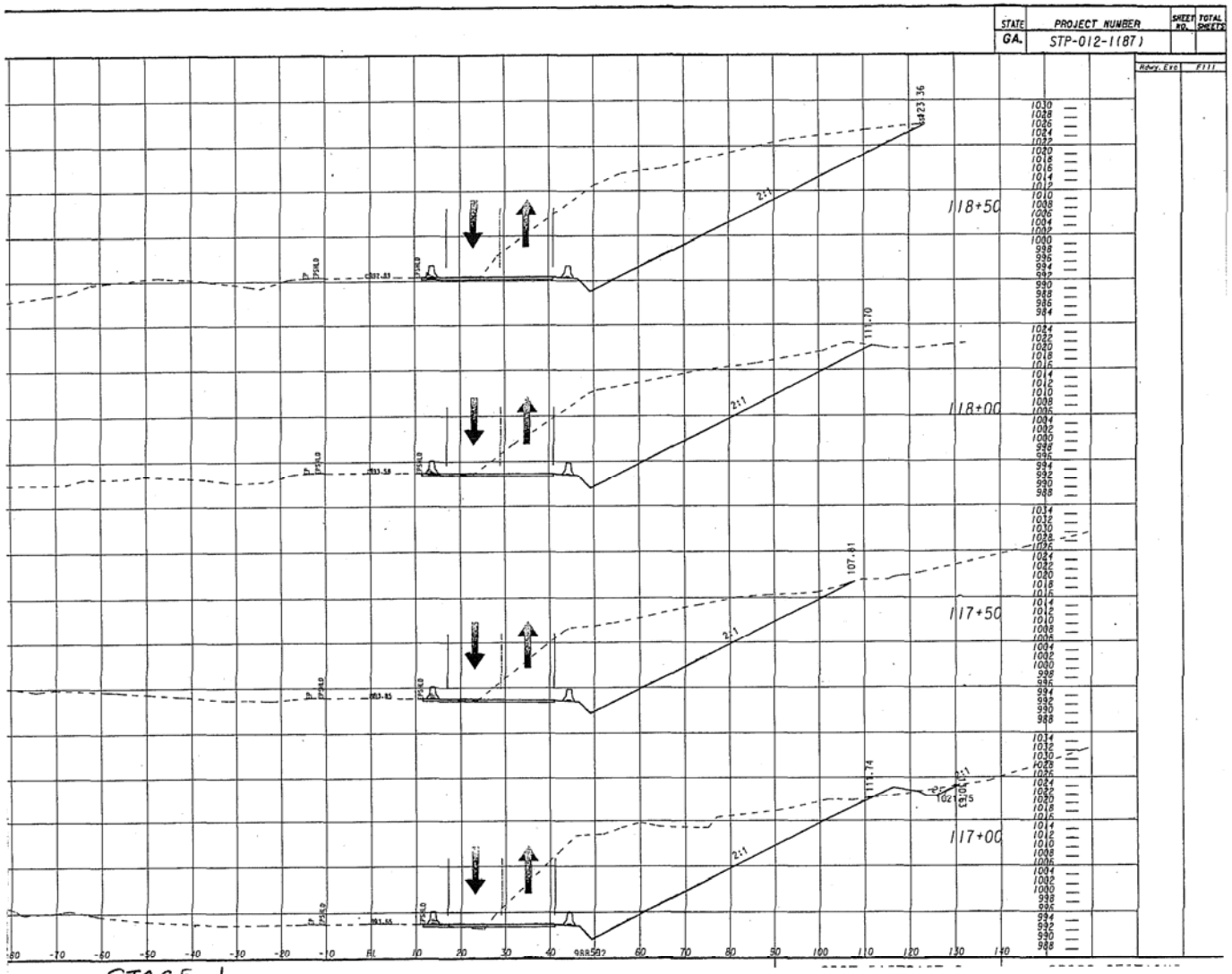
II. TRAFFIC CONTROL

A. TEMPORARY BARRIER

1. "As Proposed"

Stage construction is required for this project to build the additional passing/climbing lanes while maintaining two lanes of traffic. During the proposed first stage, traffic will be retained on the existing roadway while proposed travel lanes, drainage structures and other roadside features are constructed. A temporary concrete median barrier will be used to protect work areas and deeper fills.

The following sketch shows one section of the staging with the use of temporary concrete median barrier.



STAGE 1
CROSS SECTIONS

AS PROPOSED
TEMP CONC MEDIAN BARRIER

VII. DEVELOPMENT PHASE
II. TRAFFIC CONTROL
A. TEMPORARY BARRIER
1. "AS PROPOSED"

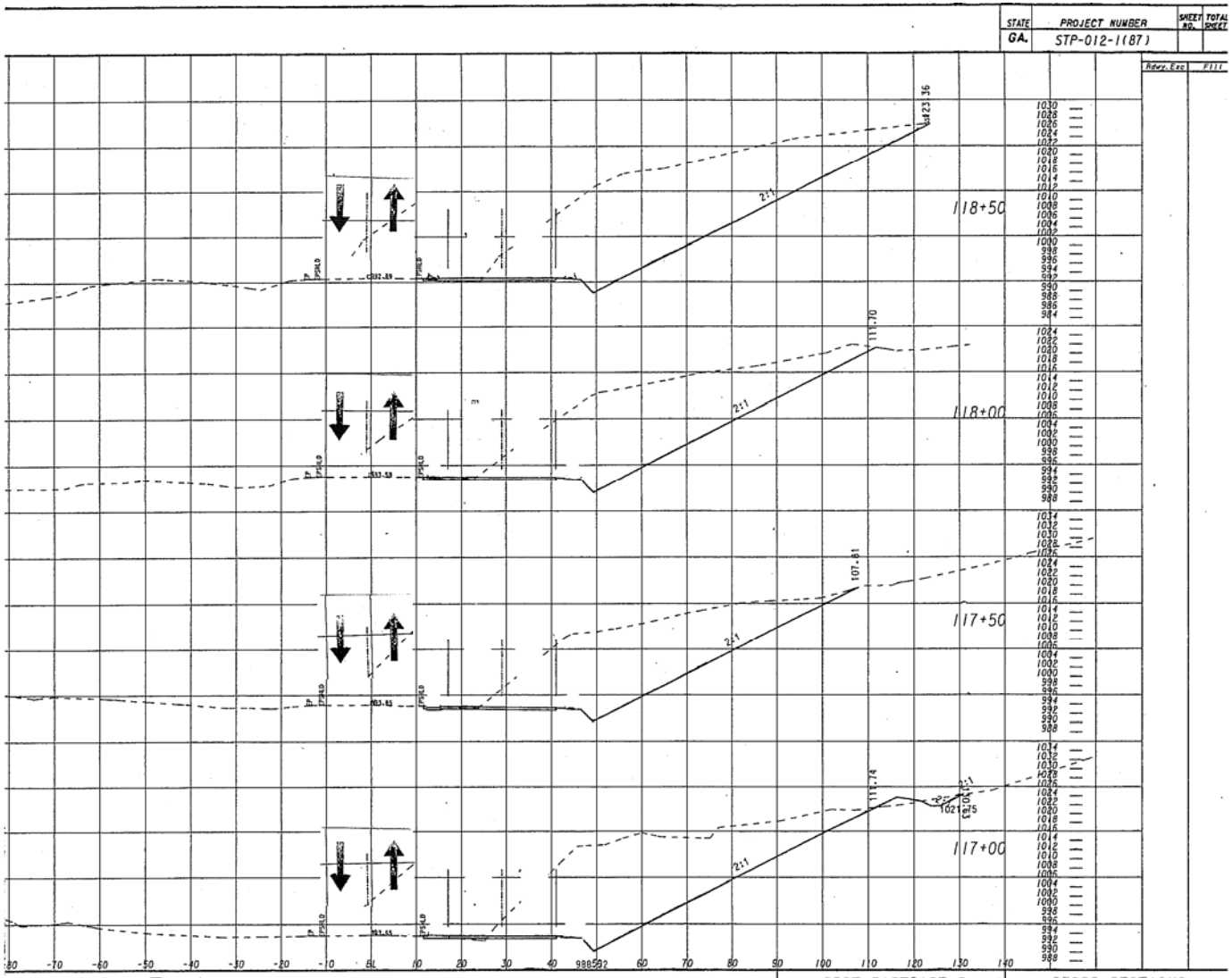
VII. DEVELOPMENT PHASE

II. TRAFFIC CONTROL

A. TEMPORARY BARRIER

2. Value Engineering Alternative

The staging, as proposed, is basically well conceived. However, there are many locations on the plans that use a temporary concrete median barrier when it does not appear necessary. The sketch on the following page is an example:



STAGE 1
CROSS SECTIONS

V E ALTERNATIVE
TEMP CONC MEDIAN BARRIER

VII. DEVELOPMENT PHASE
II. TRAFFIC CONTROL
A. TEMPORARY BARRIER
2. VALUE ENGINEERING ALTERNATIVE

II. TRAFFIC CONTROL

A. TEMPORARY BARRIER

2. Value Engineering Alternative *(continued)*

(Please note that the double lines of barrier were both removed and only one length was used in this evaluation. Also, a price for temporary concrete median barrier was not included in the Cost Estimate Report and a price of $35 was provided by the GDOT estimating section.)

The barrier itself is an obstacle and should not be introduced where it is not warranted. Therefore, the Value Engineering Study Team recommends that in cut sections and in low fill areas the temporary concrete median barrier not be used. By eliminating this barrier more than $220,000 could be saved.

VII. DEVELOPMENT PHASE
II. TRAFFIC CONTROL
A. TEMPORARY BARRIER
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
TEMPORARY CONCRETE MEDIAN BARRIER	LF	$35	11,565.0	$404,775	5,215.0	$182,525
GRAND TOTAL				**$404,775**		**$182,525**

POSSIBLE SAVINGS: $222,250

VII. DEVELOPMENT PHASE

III. CONSTRUCTION TIME

A. LENGTH OF TIME

1. "As Proposed"

Project STP-012-1(87) is over four miles of reconstruction to add climbing and passing lanes along SR 20 in Bartow County. Both left and right turn lanes are also proposed at select intersections.

The proposed construction time for this project is 24 months. This is still a preliminary estimate as to the length of time required.

VII. DEVELOPMENT PHASE

III. CONSTRUCTION TIME

A. LENGTH OF TIME

2. Value Engineering Alternative

The Value Engineering Study Team reviewed the time required to complete the construction of this project. There are several controlling items that were considered. The unclassified excavation is more than 1.3 million cubic yards and this item alone will probably require more than 1 year. There are almost 150,000 tons of base and paving and this will require perhaps as much as six months. At several locations on the project there are grade changes that will improve motorist sight distance and meet design standards. This is another item that requires more than usual time on a project. There are also thousands of linear feet of retaining walls and concrete barrier to be constructed.

After consideration of the above items as well as other aspects of the project, and in recognizing that some items will be constructed congruently, the study team feels that the proposed construction time of 24 months will require the contractor to aggressively pursue the construction. We do not feel that the work can be completed in less than 24 months.

VII. DEVELOPMENT PHASE

IV. DESIGN COMMENTS

1. Staging plans have traffic shown on the actual work area. This needs to be revised.

2. On Sheet # 68 of the staging plans there is a cross-hatched area, but no legend to identify it.

3. If the right-of-way permits, there should be a slope control on cut sections of less than 10 ft. It is recommended that cuts less than 6 ft. should be 4:1 and cuts from 7 ft. to 10 ft. should be 3:1.

4. In the *MUTCD*, destinations are shown with the arrow to the left of destinations that are to the left and the arrow is to the right of the destinations that are to the right. The D3-1 and D3-2 signs beneath intersection signs should reflect this order.

5. Suggest using curb and gutter rather than header curb. Curb & gutter is cheaper and usually easier to construct.

6. The Summary of Quantities lists header curb to the left of Sta. 105 =/-; there is actually a stream at this location.

7. The wing wall to the left at the culvert at Sta. 102 appears to be skewed incorrectly.

8. GA STD 9031L is not listed in the Index.

9. Since it is shown on the Typical Section sheets, GA STD 9028C should be included in plans.

10. There are only two retaining walls shown in the Summary of Quantities, while the presentation stated there were 14 locations with retaining walls.

11. On several sheets of the staging plans, “IMPACT” attenuators are in the legend shown.