VALUE ENGINEERING CONSTRUCTABILITY STUDY OF THE

WIDENING AND RECONSTRUCTION OF SR 72 FROM SR 17 TO CR 245/PEARL MILL ROAD

PROJECT NUMBER: MSL-1226-00(300)

ATLANTA, GEORGIA

MARCH 22, 2006

Prepared by:
VE GROUP, L.L.C.

In Association With:

Georgia Department of Transportation

VALUE ENGINEERING STUDY
TEAM LEADER

_____

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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 March 22, 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:

- Constructability
- Future Maintenance
- Impact to Local Traffic
- Construction Time
- Construction Cost
- Ease of construction
- Impact to local businesses

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.

RECOMMENDATION NUMBER 1-CONSTRUCTABILITY

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. LOCAL ROAD TURN LANES

Value Engineering Alternative: Eliminate where possible.

If this recommendation can be implemented, there is a possible savings of ***$115,177.***

RECOMMENDATION NUMBER 2- MATERIALS

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. MATERIAL FOR STAGING

Value Engineering Alternative: Verify availability and cost.

B. HAUL LENGTH OF MATERIAL

Value Engineering Alternative: Reduce waste.

If this recommendation can be implemented, there is a possible savings of ***$ 824,149.***

C. RAILROAD CROSSING MATERIAL

Value Enhancement Alternative: Use concrete or rubber.

If this recommendation can be implemented, there is a possible increase in cost of ***$25,880.***

SUMMARY OF RECOMMENDATIONS *(continued)*

RECOMMENDATION NUMBER 3- TRAFFIC CONTROL

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. EXISTING PAVEMENT

Value Enhancement Alternative: Cul-de-sac or connect at both ends.

If this recommendation can be implemented, there is a possible increase in cost of ***$22,457.***

B. RAILROAD CROSSING

Value Engineering Alternative: Eliminate and relocate shipper.

If this recommendation can be implemented, there is a possible savings of ***$168,216.***

C. DETOURS/ROAD CLOSINGS

Value Enhancement Alternative: Eliminate where possible.

If this recommendation can be implemented, there is a possible increase in cost of ***$338,702.***

D. SIGNING AND MARKING

Value Engineering Alternative: Comply with standards.

RECOMMENDATION NUMBER 4- CONTRACTOR WORK HOURS

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. CLOSURES

Value Engineering Alternative: No closures from 7am-9am and 4pm-6pm, Saturdays and Sundays.

SUMMARY OF RECOMMENDATIONS *(continued)*

RECOMMENDATION NUMBER 5- CONSTRUCTION TIME

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. LENGTH OF TIME

Value Engineering Alternative: Use 24 months for overall project.

B. ROAD CLOSURES

Value Engineering Alternative: Limit time of closure.

C. FIVE LANE SECTION

Value Engineering Alternative: Use an intermediate completion date.

RECOMMENDATION NUMBER 6- STAGE CONSTRUCTION

The Value Engineering Team recommends that the Value Engineering Alternative be implemented.

A. STAGES

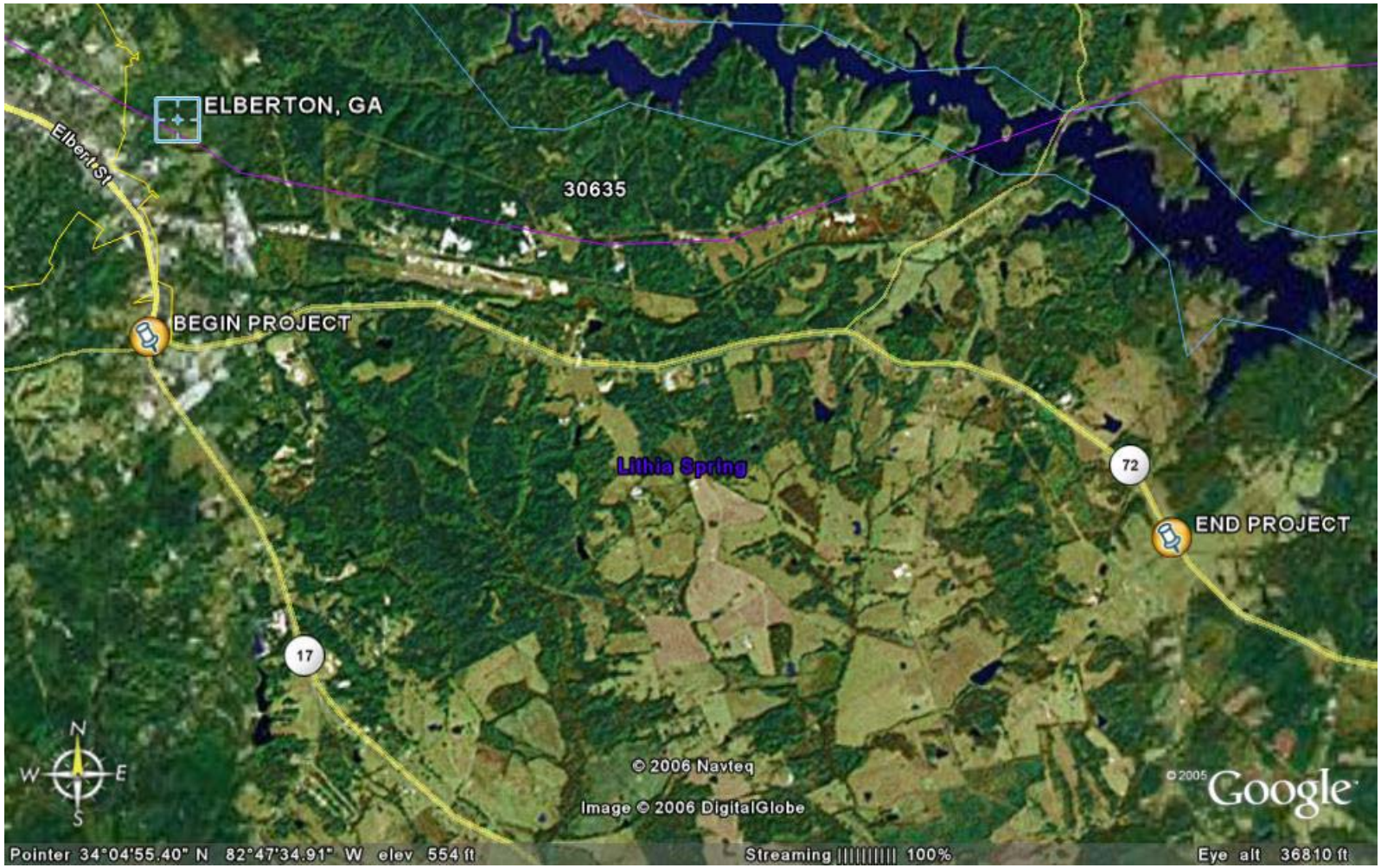
Value Engineering Alternative: Eliminate stage three.

B. PROJECT TERMINUS

Value Enhancement Alternative: Build whole typical farther into adjacent project.

If this recommendation can be implemented, there is a possible increase in cost of ***$54,490.***

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
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PROJECT DESCRIPTION

This project consists of the widening and reconstruction of SR 72 beginning at SR 17 and ending at the intersection with CR 245/Pearl Mill Road. There are no bridges within the project limits. The project length is 7.02 miles.

IV. INVESTIGATION PHASE

VALUE ENGINEERING STUDY BRIEFING

WIDENING AND RECONSTRUCTION OF SR 72 FROM SR 17 TO CR 245/PEARL MILL ROAD March 22, 2006		
NAME	**AFFILIATION**	**PHONE**
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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. LOCAL ROAD TURN LANES**

II. MATERIALS

- **A. MATERIAL FOR STAGING**
- **B. HAUL LENGTH OF MATERIAL**
- **C. RAILROAD CROSSING MATERIAL**

III. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

- **A. EXISTING PAVEMENT**
- **B. RAILROAD CROSSING**
- **C. DETOURS/ROAD CLOSINGS**
- **D. SIGNING AND MARKING**

IV. CONTRACTOR WORK HOURS

- **A. CLOSURES**

V. CONSTRUCTION TIME

- **A. LENGTH OF TIME**
- **B. ROAD CLOSURES**
- **C. FIVE LANE SECTION**

VI. STAGE CONSTRUCTION

- **A. STAGES**
- **B. PROJECT TERMINUS**

V. SPECULATION PHASE

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

I. CONSTRUCTABILITY

A. LOCAL ROAD TURN LANES

- Eliminate where possible.

II. MATERIALS

A. MATERIAL FOR STAGING

- Verify availability and cost.

B. HAUL LENGTH OF MATERIAL

- Reduce waste.

C. RAILROAD CROSSING MATERIAL

- Use concrete or rubber.

III. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

A. EXISTING PAVEMENT

- Cul-de-sac or connect at both ends.

B. RAILROAD CROSSING

- Eliminate and relocate shipper.

C. DETOURS/ROAD CLOSINGS

- Eliminate where possible.

D. SIGNING AND MARKING

- Comply with standards.

V. SPECULATION PHASE

IV. CONTRACTOR WORK HOURS

A. CLOSURES

- No closures from 7am-9am and 4pm-6pm, Saturdays and Sundays.

V. CONSTRUCTION TIME

A. LENGTH OF TIME

- Use 24 months for overall project.

B. ROAD CLOSURES

- Limit time of closure.

C. FIVE LANE SECTION

- Use an intermediate completion of 12 months.

VI. STAGE CONSTRUCTION

A. STAGES

- Eliminate stage three.

B. PROJECT TERMINUS

- Build whole typical farther into adjacent project.

VI. EVALUATION PHASE

A. ALTERNATIVES

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

I. CONSTRUCTABILITY

A. LOCAL ROAD TURN LANES

Value Engineering Alternative - *Eliminate where possible.*

II. MATERIALS

A. MATERIAL FOR STAGING

Value Engineering Alternative - *Verify availability and cost.*

B. HAUL LENGTH OF MATERIAL

Value Engineering Alternative - *Reduce waste.*

C. RAILROAD CROSSING MATERIAL

Value Engineering Alternative - *Use concrete or rubber.*

III. TRAFFIC CONTROL/MAINTENANCE OF TRAFFIC

A. EXISTING PAVEMENT

Value Engineering Alternative - *Cul-de-sac or connect at both ends.*

B. RAILROAD CROSSING

Value Engineering Alternative - *Eliminate and relocate shipper.*

C. DETOURS/ROAD CLOSINGS

Value Engineering Alternative - *Eliminate where possible.*

D. SIGNING AND MARKING

Value Engineering Alternative - *Comply with standards.*

A. ALTERNATIVES *(continued)*

IV. CONTRACTOR WORK HOURS

A. CLOSURES

Value Engineering Alternative - *No closures from 7am-9am and 4pm-6pm, Saturdays and Sundays.*

V. CONSTRUCTION TIME

A. LENGTH OF TIME

Value Engineering Alternative - *Use 24 months for overall project.*

B. ROAD CLOSURES

Value Engineering Alternative - *Limit time of closure.*

C. FIVE LANE SECTION

Value Engineering Alternative - *Use an intermediate completion of 12 months.*

VI. STAGE CONSTRUCTION

A. STAGES

Value Engineering Alternative - *Eliminate stage three.*

B. PROJECT TERMINUS

Value Enhancement Alternative - *Build whole typical farther into adjacent project.*

VI. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

A. LOCAL ROAD TURN LANES

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

II. MATERIALS

A. MATERIAL FOR STAGING

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

B. HAUL LENGTH OF MATERIAL

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

C. RAILROAD CROSSING MATERIAL

(1) AS PROPOSED
(2) VALUE ENHANCEMENT ALTERNATIVE

VI. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

CUL-DE-SAC CR 396/HEARD ROAD

(1) AS PROPSED
(2) VALUE ENHANCEMENT ALTERNATIVE

EXISTING SR 72 STA. 200+00 to STA. 260+00

(3) AS PROPSED
(4) VALUE ENHANCEMENT ALTERNATIVE

B. RAILROAD CROSSING

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

C. DETOURS/ROAD CLOSINGS

(1) AS PROPOSED
(2) VALUE ENHANCEMENT ALTERNATIVE

D. SIGNING AND MARKING

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

VI. DEVELOPMENT PHASE

IV. CONTRACTOR WORK HOURS

A. CLOSURES

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

V. CONSTRUCTION TIME

A. LENGTH OF TIME

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

B. ROAD CLOSURES

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

C. FIVE LANE SECTION

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

VI. STAGE CONSTRUCTION

A. NUMBER OF STAGES

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

B. PROJECT TERMINUS

(1) AS PROPOSED
(2) VALUE ENHANCEMENT ALTERNATIVE

VII. DEVELOPMENT PHASE

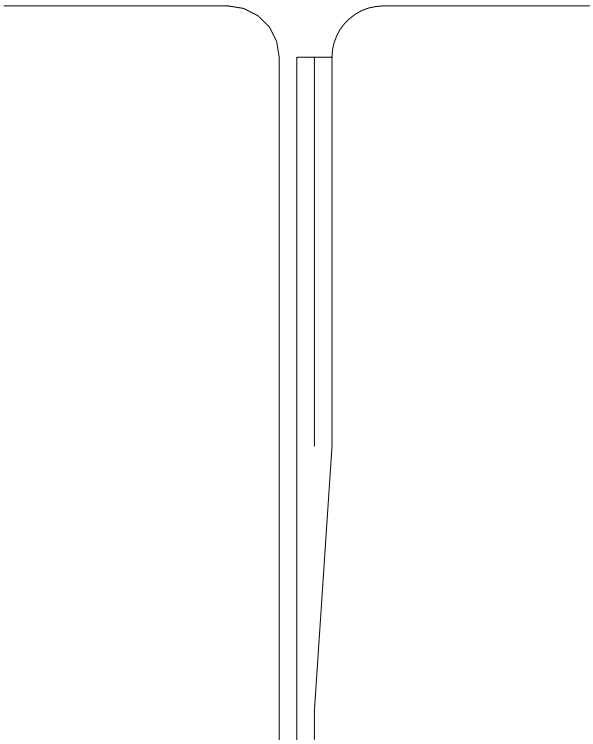
I. CONSTRUCTABILITY

A. LOCAL ROAD TURN LANES

1. "As Proposed"

The following table identifies the intersection approaches designed with a right turn lane.

CROSS ROAD	APPROACH	LT		THRU		RT		RT Y/N	AM	PM
		AM	PM	AM	PM	AM	PM			
CR 394	S	20	10	0	0	0	0	N	0.00%	0.00%
CR 279	N	15	5	0	0	35	15	Y	70.00%	75.00%
CR 278	S	45	25	0	0	10	10	N	18.18%	28.57%
CR 45	S	70	40	40	20	5	5	N	4.35%	7.69%
	N	25	55	20	40	5	5	N	10.00%	5.00%
CR 271	N	NT						N		
CR 47	S	50	25	0	0	10	10	N	16.67%	28.57%
CR 44	N	NT						N		
	S	NT						N		
CR 304	N	10	10	0	0	25	15	Y	71.43%	60.00%
CR 296	N	30	50	0	0	10	10	N	25.00%	16.67%
CR 396	S	20	10	0	0	0	0	N	0.00%	0.00%
CR 245	N	20	10	0	0	35	15	Y	63.64%	60.00%
CR 41	S	20	10	0	0	5	5	N	20.00%	33.33%



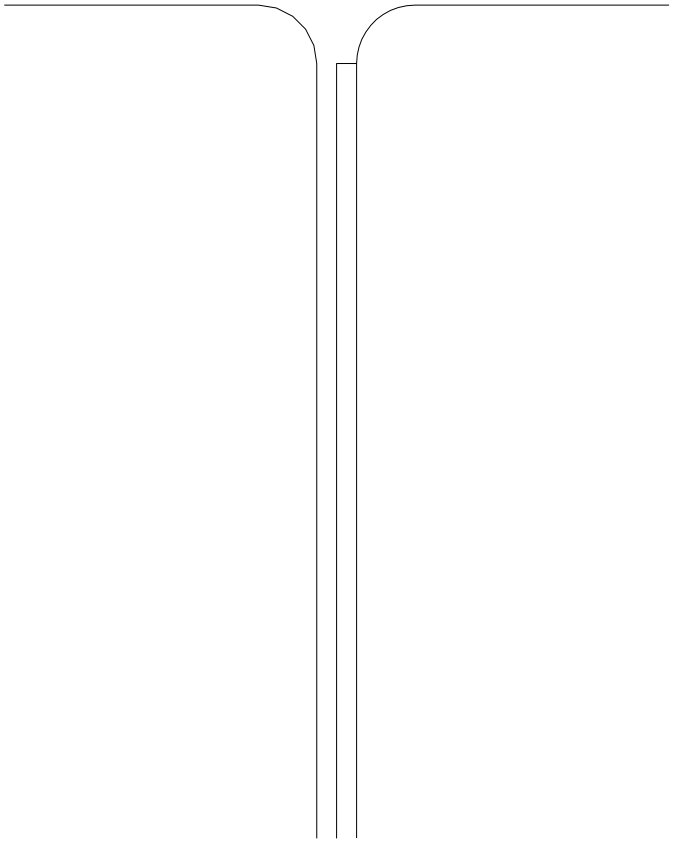
VII. DEVELOPMENT PHASE

I. CONSTRUCTABILITY

A. LOCAL ROAD TURN LANES

2. Value Engineering Alternative

The Value Engineering Team recommends eliminating right turn lanes for any intersection approach that does not have over 50% right turn movements. With this criteria, 11 of the 14 intersection approaches that have right turn lanes can be constructed without a dedicated right turn lane.



I. CONSTRUCTABILITY
A. RIGHT TURN LANES
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
CR PAVEMENT	SY	$20.00	7,333.3	$146,667	0.0	$0
10” AGGREGATE BASE	SY	$12.00	7,333.3	$88,000	14,666.7	$176,000
BORROW EXCAVATION	CY	$6.00	7,333.3	$44,000	1,147.5	$6,885
SUBTOTAL				**$278,667**		**$182,885**
INFLATION 2 YEARS @ 5%	10.3%			$28,563		$18,746
TRAFFIC CONTROL/MOT	0%			$0		$0
CONTINGENCY	10%			$27,867		$18,746
RIGHT-OF-WAY	AC	$10,000.00		$0		$0
GRAND TOTAL				**$335,097**		**$219,919**

POSSIBLE SAVINGS: $115,177

VII. DEVELOPMENT PHASE

II. MATERIALS

A. MATERIAL FOR STAGING

1. "As Proposed"

Project MSL-1226 (300) is a major grading project with an estimated 920,000 cubic yards of unclassified excavation. Of this excavation, approximately 350,000 cubic yards are not needed to satisfy embankment requirements and will need to be wasted. The cut areas are not immediately adjacent to the fill areas so much of the material will have to be trucked in traffic. This will mean that the cost of the unclassified excavation will be more in line with the cost of borrow. The cost of earthwork for this project is therefore $5,520,000 rather than the proposed cost of $3,551,000.

The embankment material appears to be available for the proposed staging, except as mentioned above.

VII. DEVELOPMENT PHASE

II. MATERIALS

A. MATERIAL FOR STAGING

2. Value Engineering Alternative

The embankment material appears to be available for the proposed staging. The most pressing problem with the earthwork on this project is the fact that there is an estimated 350,000 cubic yards of waste. This is a tremendous amount of material that will have to be disposed of by the contractor and, more than likely, the contractor will have to obtain a site or sites to dispose of this material. The material will have to be trucked to these locations. Again, as previously stated, this will also influence a higher cost for the unclassified item.

The recommendation of the study team is that the design be modified to significantly reduce this huge amount of waste material.

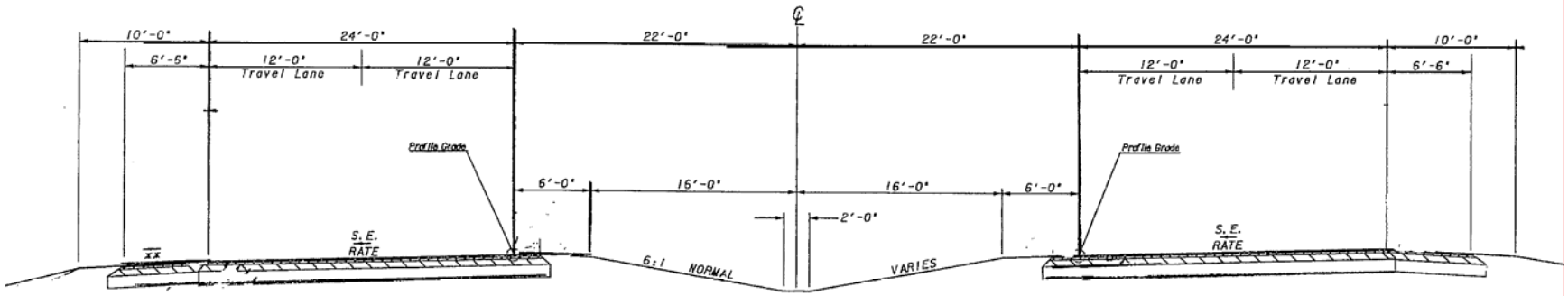
VII. DEVELOPMENT PHASE

II. MATERIALS

B. HAUL LENGTH OF MATERIAL

1. "As Proposed"

The proposed grade line creates approximately 350,000 CY of waste. In addition, haul distances will be up to 2 miles.



Typical Section

II-B

As Proposed

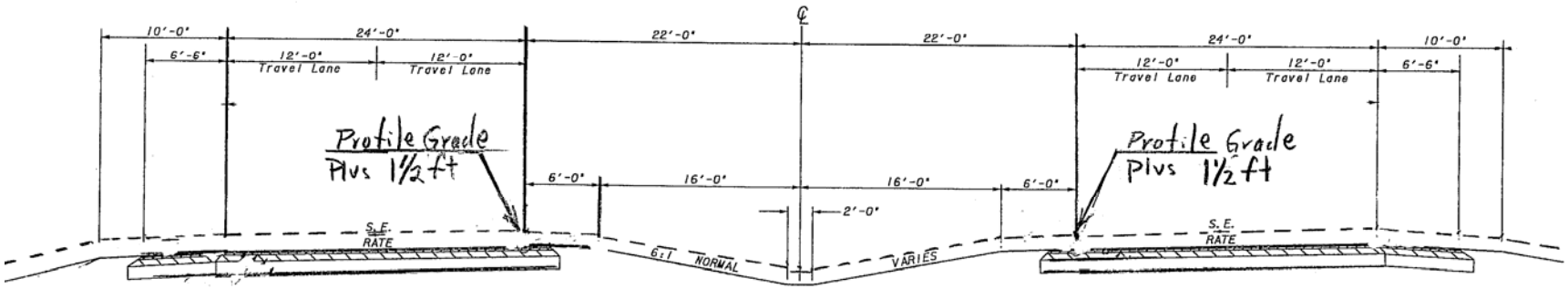
VII. DEVELOPMENT PHASE

II. MATERIALS

B. HAUL LENGTH OF MATERIAL

2. Value Engineering Alternative

The Value Engineering Alternative is to raise the grade in the larger cuts and fills throughout the project starting east of CR 45. This should not affect driveway connections or grade crossings significantly. Since this should have off-setting right-of-way costs, right-of-way was not considered. Raising the grade will reduce right-of-way in the cuts as the slope distance is shortened, and increase the right-of-way in the fills as the slope distance is increased. The lengths and depths of the cuts and fills are approximately equal. Raising the grade 1.5' will reduce the waste by approximately 165,000 CY, and result in a waste of 185,000 CY for the project. Other measures to reduce waste include false cuts and flushing the fill slopes. This could possibly eliminate the guardrail.



Typical Section

II-B
VE ALT

II. MATERIALS
B. HAUL LENGTH OF MATERIAL
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
WASTE GENERATED BY PROPOSED GRADE LINE	CY	$3.86	350,000.0	$1,351,000	0.0	$0
WASTE GENERATED AFTER RAISING THE GRADE 1.5'	CY	$3.86	0.0	$0	185,000.0	$714,100
SUBTOTAL				**$1,351,000**		**$714,100**
E & C	10%			$135,000		$71,410
INFLATION (3% FOR 6 YEARS)	19.4%			$262,094		$138,535
GRAND TOTAL				**$1,748,094**		**$924,045**

POSSIBLE SAVINGS: $824,149

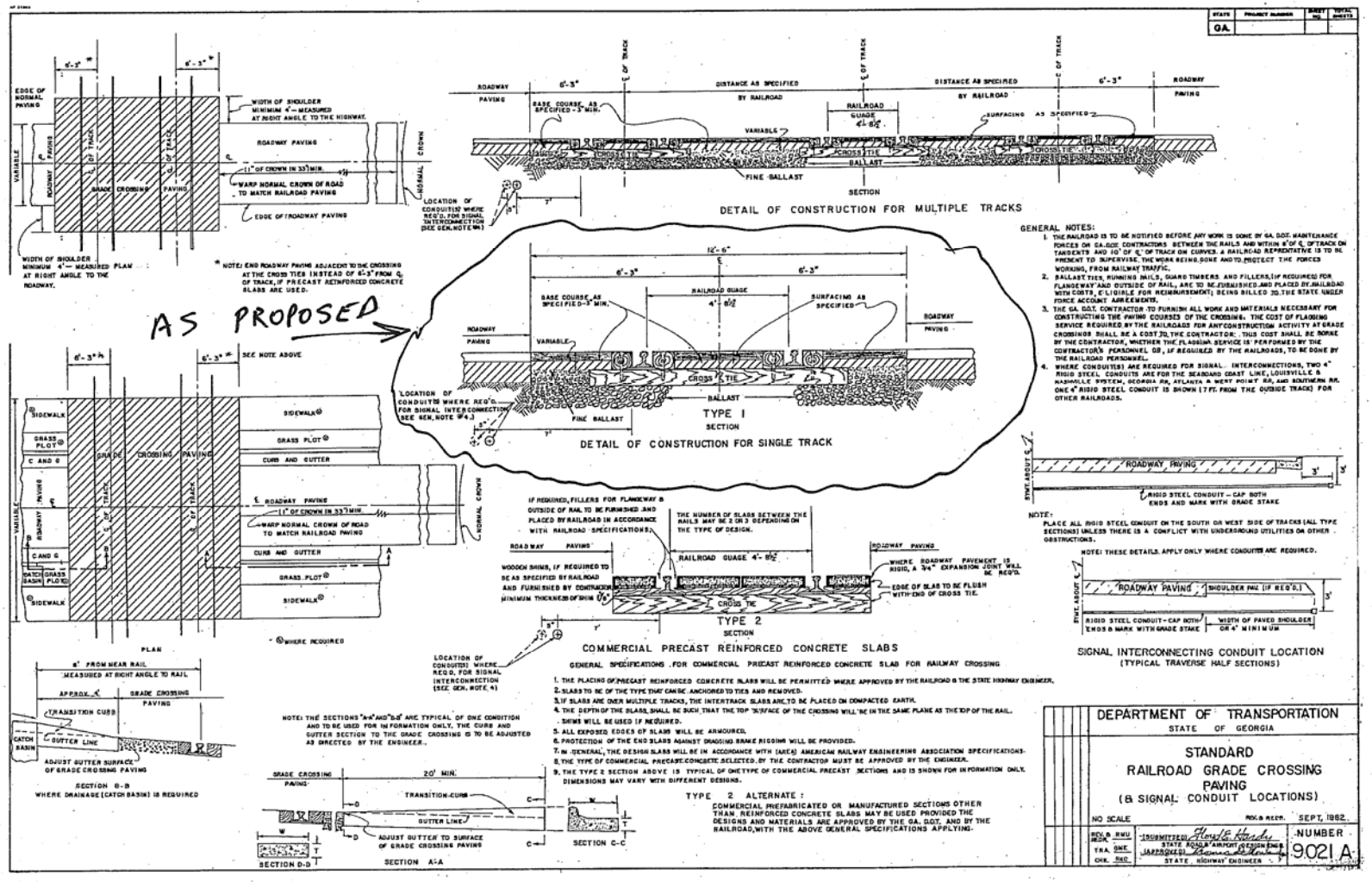
VII. DEVELOPMENT PHASE

II. MATERIALS

C. RAILROAD CROSSING MATERIAL

1. "As Proposed"

Project MSL-1226 (300) includes a railroad grade crossing with the CSX Railroad near Sta. 123. This is in the five-lane urban section. Typically, railroad grade crossings are constructed using crossties on either side of each rail and placing asphalt in the center of the tracks.



II. MATERIALS

C. RAILROAD CROSSING MATERIALS

AS PROPOSED

VII. DEVELOPMENT PHASE

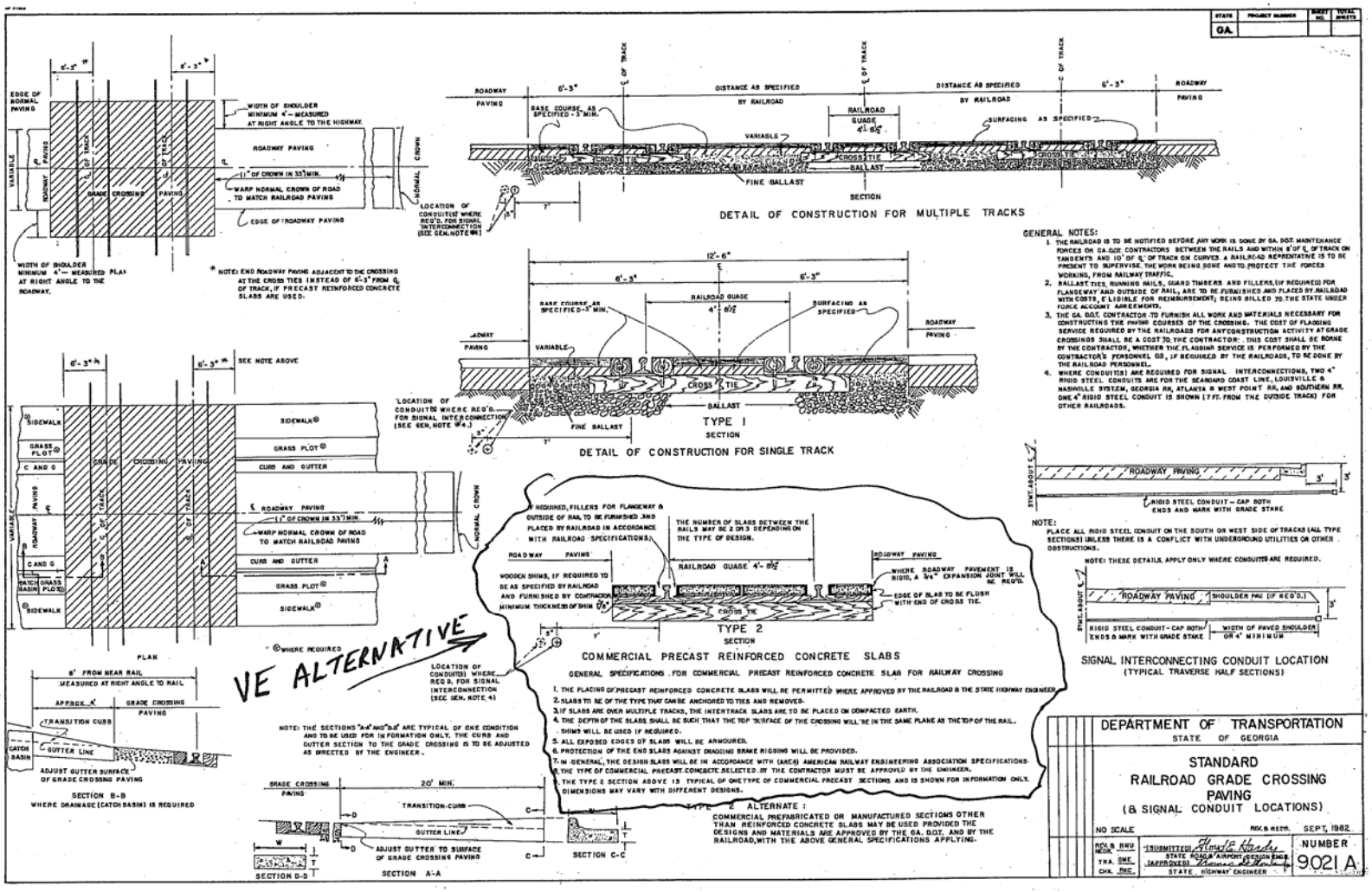
II. MATERIALS

C. RAILROAD CROSSING MATERIAL

2. Value Enhancement Alternative

The standard railroad grade crossing is not designed to withstand the constant impact of vehicular traffic, especially truck traffic. Consequently, it will require frequent maintenance to provide an acceptable smooth crossing. This maintenance is accomplished by the railroad and, in many instances, the railroad requires traffic to be detoured when this repair work is being done.

It is the recommendation of the study team that a special crossing treatment be used to construct this at-grade crossing with the CSX Railroad. Several different types of material have been used successfully at other locations in Georgia and other states. These materials include concrete and rubber. Georgia Standard 9021A is attached detailing the construction of a railroad grade crossing. The initial cost is estimated to be 20% higher than the standard crossing. This would add a value enhancement cost of $25,880 to this project. However, the longer service life and smoother riding surface will make this cost a beneficial improvement.



II. MATERIALS

C. RAILROAD CROSSING MATERIALS

VE ALTERNATIVE

II. MATERIALS
C. RAILROAD CROSSING MATERIAL
VALUE ENHANCEMENT ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
RAILROAD GRADE CROSSING ASPHALT	EA	$100,000.00	1.0	$100,000	0.0	$0
RAILROAD GRADE CROSSING CONCRETE	EA	$120,000.00	0.0	$0	1.0	$120,000
SUBTOTAL				**$100,000**		**$120,000**
MOBILIZATION (THIS IS SUB+CONTIN. X %=)	0.0%			$0		$0
TRAFFIC CONTROL/MOT	0.0%			$0		$
CONTINGENCY	10%			$10,000		$12,000
INFLATION (3% FOR 6 YEARS)	19.4%			$19,400		$23,280
GRAND TOTAL				**$129,400**		**$155,280**

POSSIBLE COST INCREASE: $25,880

VII. DEVELOPMENT PHASE

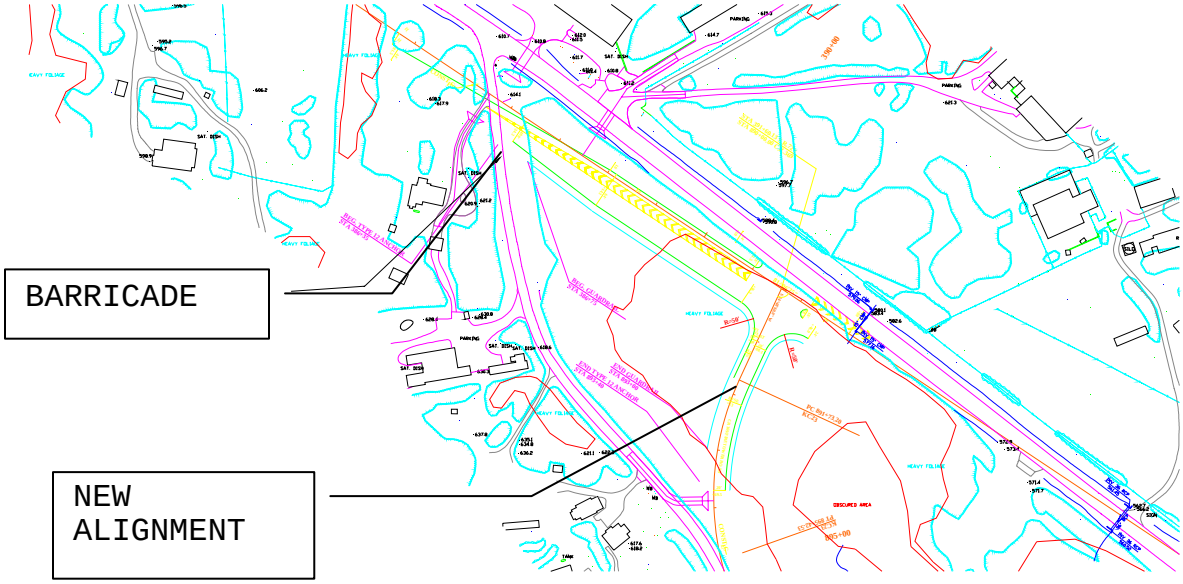
III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

1. "As Proposed"

CUL-DE-SAC CR 396/HEARD ROAD

CR 396/Heard Road will be realigned to form a better geometric connection with SR 72. The new alignment will begin approximately 800' from SR 72. This 800' will be terminated with a barricade.



AS PROPOSED TERMINUS OF CR 396

VII. DEVELOPMENT PHASE

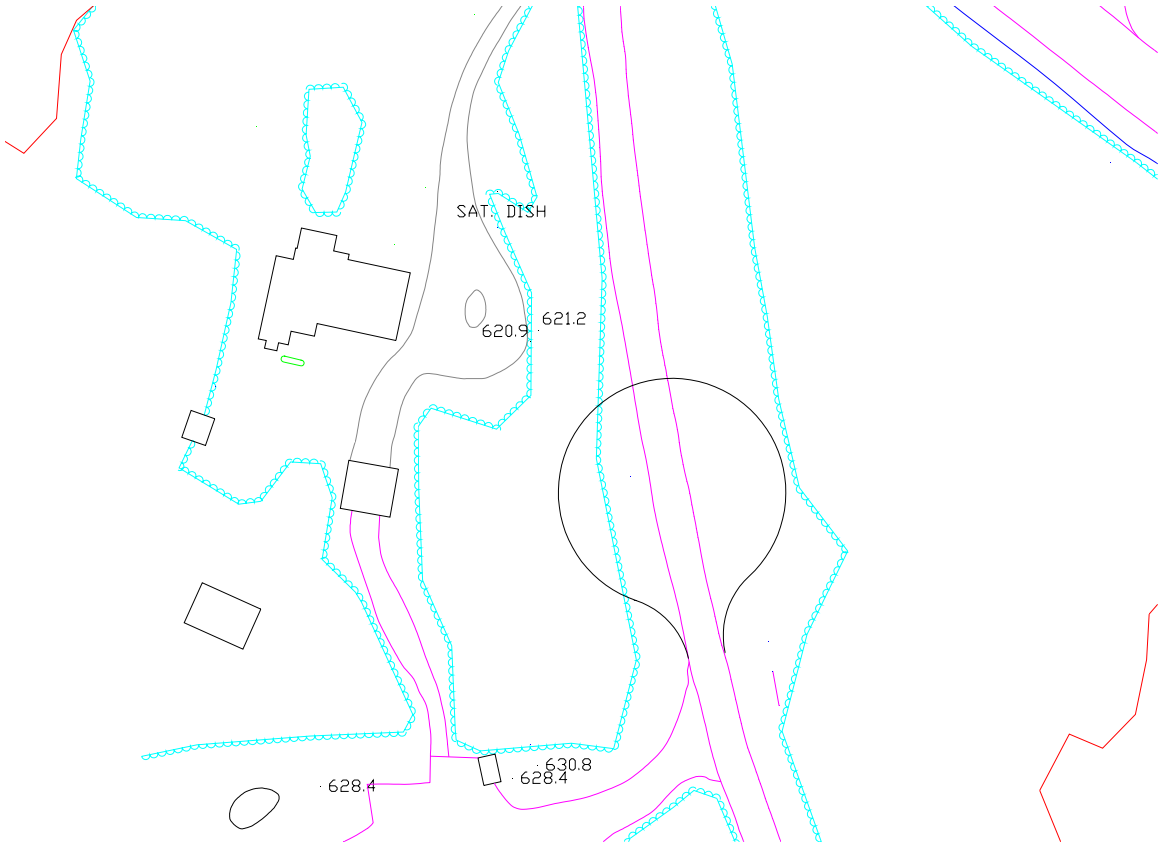
III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

2. Value Enhancement Alternative

CUL-DE-SAC CR 396/HEARD ROAD

The Value Engineering Team recommends constructing a cul-de-sac at end of the closed portion of CR 396. A cul-de-sac provides a better turn around capability for emergency vehicles as well as other motorists.



VALUE ENHANCEMENT ALTERNATIVE
CUL-DE-SAC AT THE END OF OLD CR 396

III. TRAFFIC CONTROL
A. EXISTING PAVEMENT
CUL-DE-SAC CR 396/HEARD ROAD
VALUE ENHANCEMENT ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
CR ROAD PAVEMENT	SY	$20.00	0.0	$0	933.3	$18,667
SUBTOTAL				**$0**		**$18,667**
INFLATION (5% FOR 2 YEARS)	10.3%			$0		$1,923
TRAFFIC CONTROL/MOT	0.0%			$0		$0
CONTINGENCY	10%			$0		$1,867
RIGHT-OF-WAY	AC	$10,000.00		$0		$0
GRAND TOTAL				**$0**		**$22,457**

POSSIBLE COST INCREASE: $22,457

VII. DEVELOPMENT PHASE

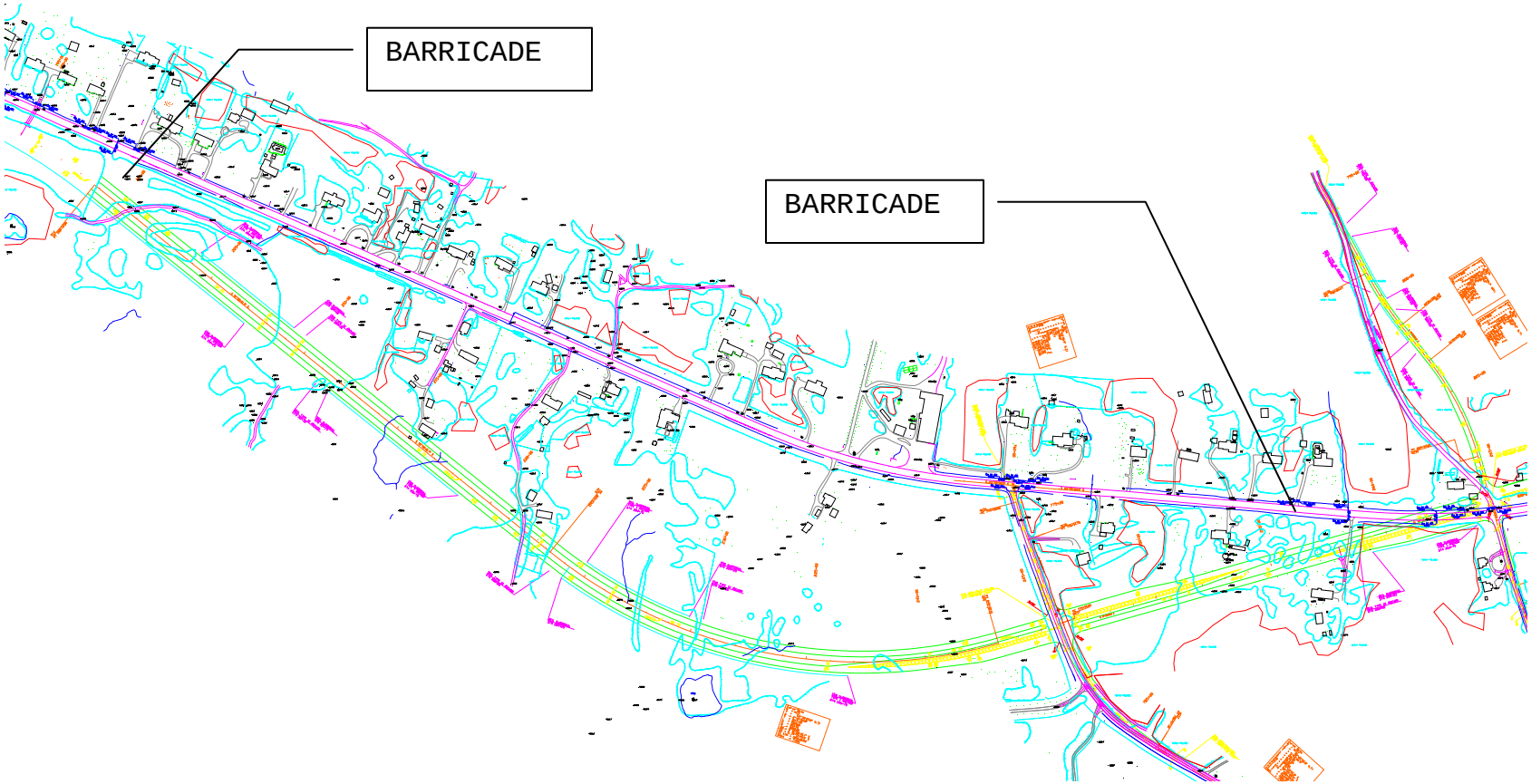
III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

3. "As Proposed"

EXISTING SR 72 STA. 200+00 to STA. 260+00

The current plan to sever the existing road from the new alignment is to dead end the road with barricades.



AS PROPOSED
TERMINUS OF EXISTING SR 72 USING BARRICADES

VII. DEVELOPMENT PHASE

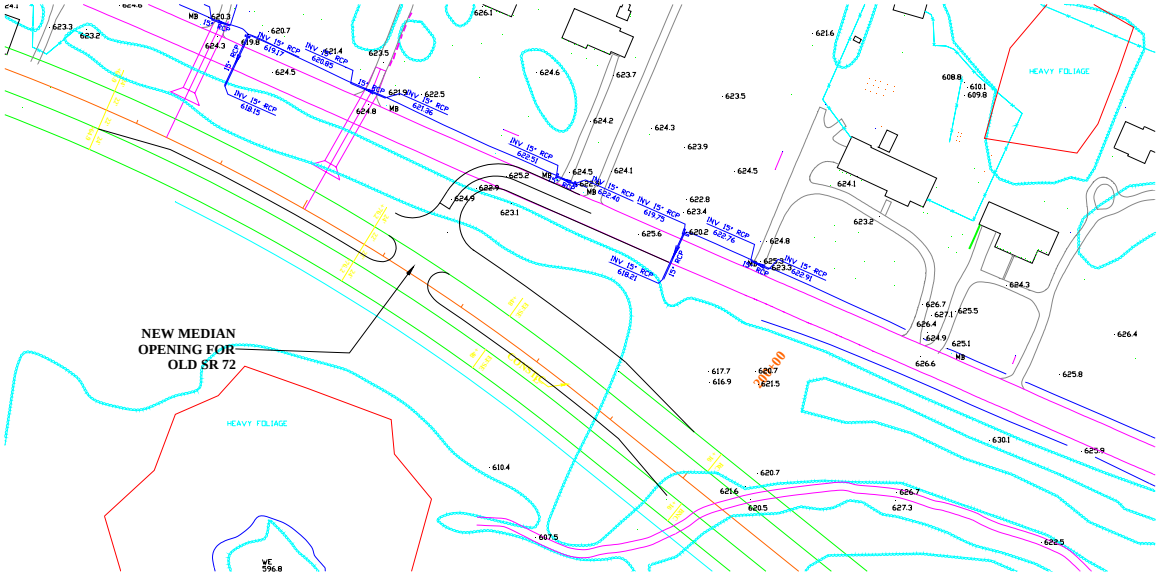
III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

4. Value Enhancement Alternative

EXISTING SR 72 STA. 200+00 to STA. 260+00

The Value Engineering Team recommends tying in the ends of the existing SR 72 with the new alignment as shown below. The west end of old SR 72 would connect with a median opening and the east end would connect Jenkins Road approximately 500' north of SR 72. CR 47/Bakers Ferry Road would terminate at the new alignment of SR 72. That segment of CR 47 north of SR 72 would be demolished up to the first driveway on the right side.



VALUE ENHANCEMENT ALTERNATIVE
CONNECTION AT WEST END OF OLD SR 72

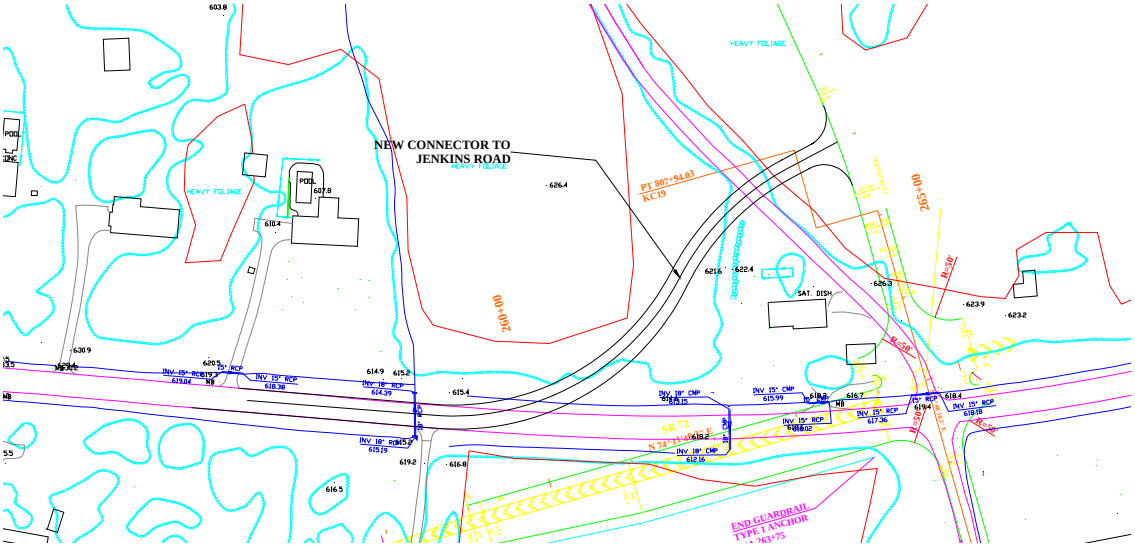
VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

4. Value Enhancement Alternative

EXISTING SR 72 STA. 200+00 to STA. 260+00



VALUE ENHANCEMENT ALTERNATIVE
CONNECTION AT EAST END OF OLD SR 72

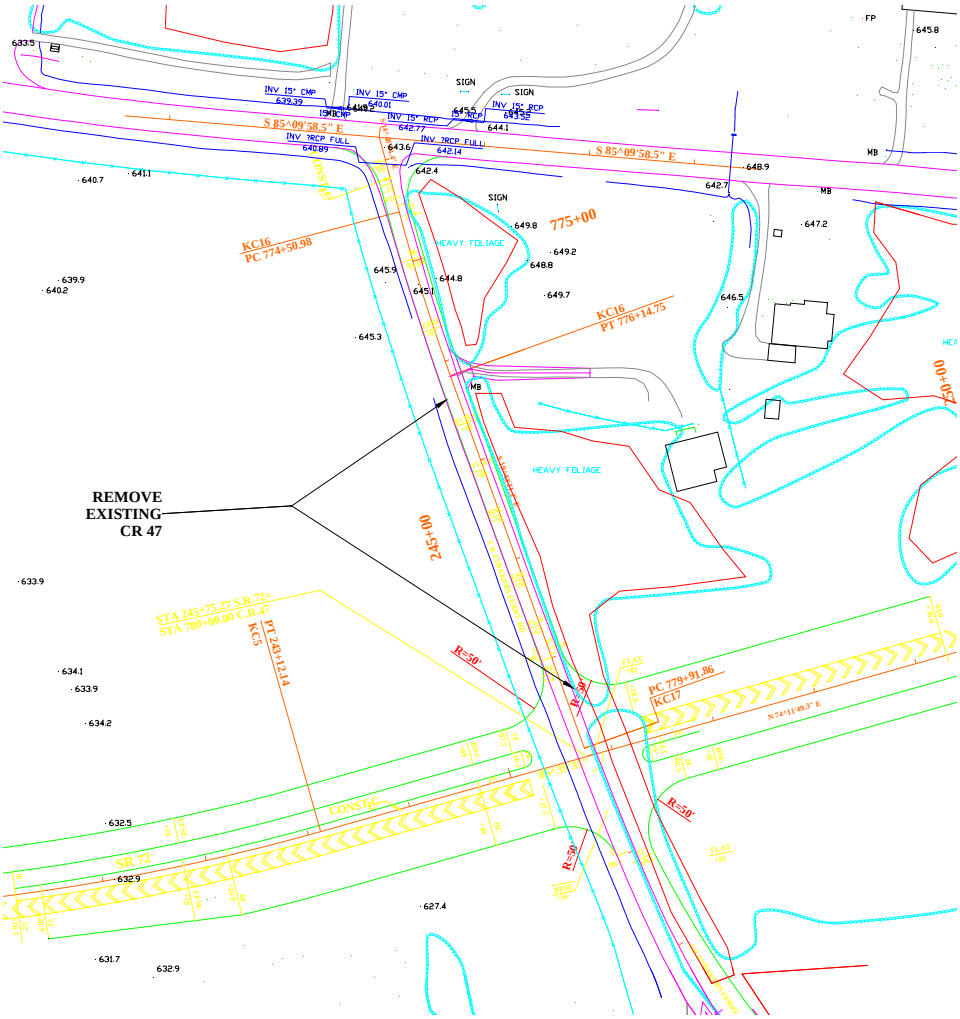
VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

A. EXISTING PAVEMENT

4. Value Enhancement Alternative

EXISTING SR 72 STA. 200+00 to STA. 260+00



VALUE ENHANCEMENT ALTERNATIVE
CR 47

III. TRAFFIC CONTROL
A. EXISTING PAVEMENT
EXISTING SR 72 STA. 200+00 to STA. 260+00
VALUE ENHANCEMENT ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
CR ROAD PAVEMENT	SY	$20.00	0.0	$0	2,933.3	$58,666
DEMOLITION OF CR 47	CY	$6.00	0.0	$0	1,944.4	$11,666
SUBTOTAL				**$0**		**$70,332**
INFLATION (5% FOR 2 YEARS)	10.3%			$0		$7,244
TRAFFIC CONTROL/MOT	0.0%			$0		$0
CONTINGENCY	10%			$0		$7,033
RIGHT-OF-WAY	AC	$10,000.00		$0		$0
GRAND TOTAL				**$0**		**$84,609**

POSSIBLE COST INCREASE: **$84,609**

VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

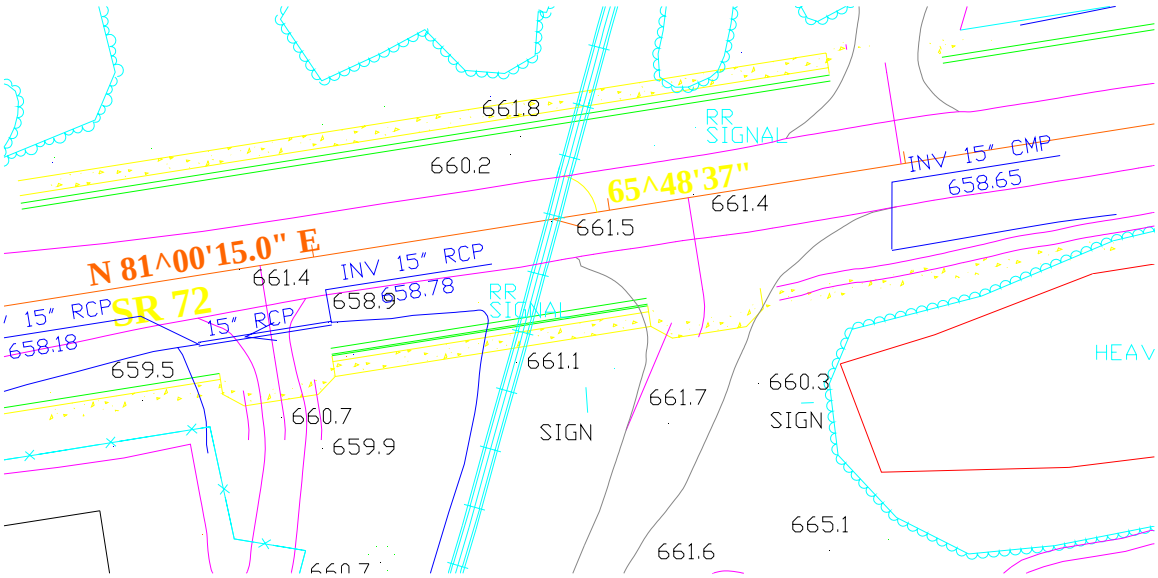
B. RAILROAD CROSSING

1. "As Proposed"

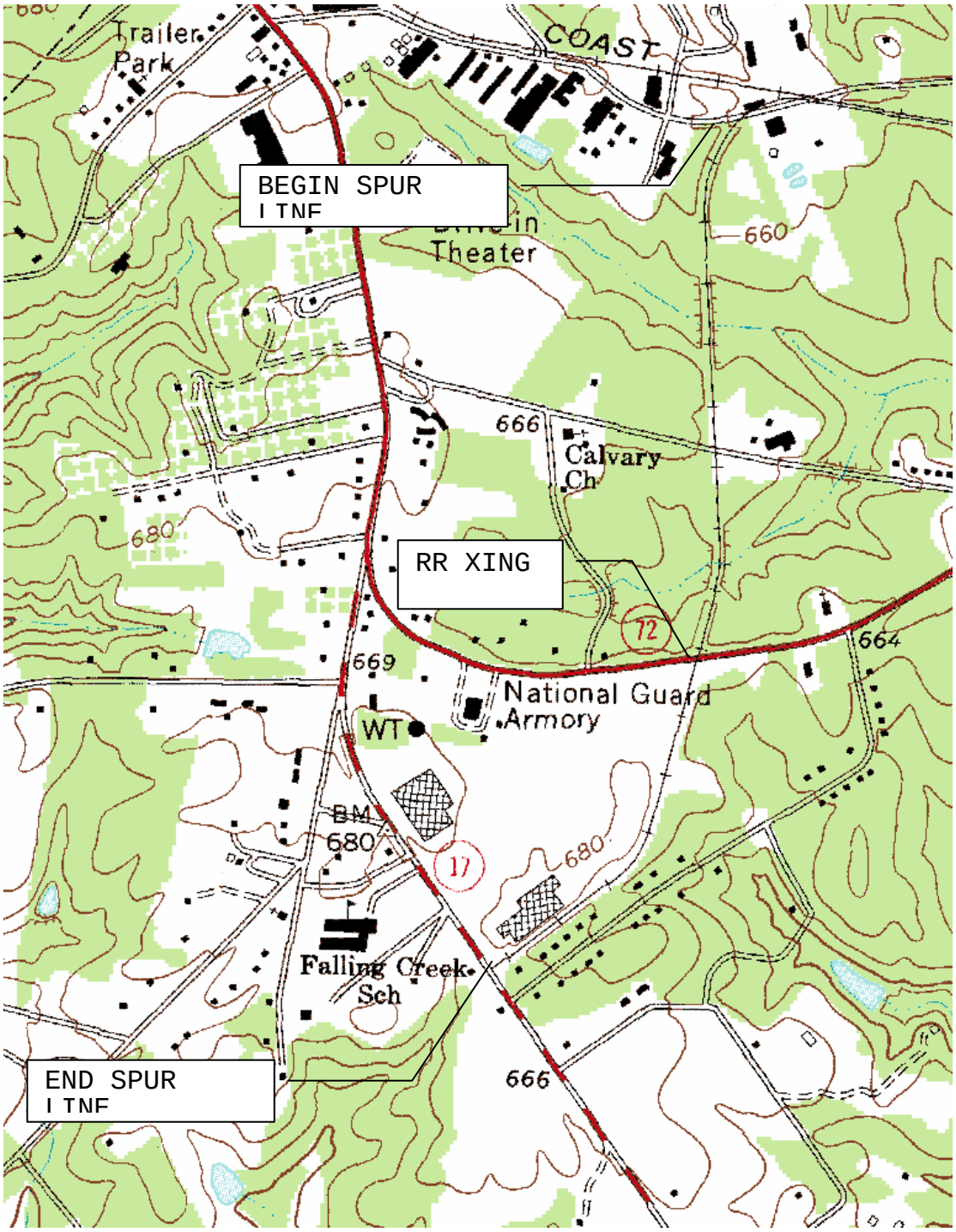
CSX currently has a spur line that crosses SR 72 2,200' east of SR 17. This spur line runs from the Mainline CSX Track, approximately 3,000' to the north and terminates just north of SR 17 approximately 2,500' to the south of SR 72.

The existing railroad crossing has only Railroad Cross Bucks. As a roadway on the NHS the railroad crossing will have to be upgraded with gates and lights. In order to construct a standard railroad crossing for a 5-lane roadway, the center lane will have to transition to a raised median approaching the crossing.

It is the Team's understanding there may be as little as 2 or 3 trains per week.



AS PROPOSED RAILROAD CROSSING


Trailer Park
COAST
BEGIN SPUR
LTNF
Theater
660
666
Calvary Ch
680
RR XING
72
664
669
National Guard Armory
WT
BM 680
17
680
Falling Creek Sch
END SPUR
LTNF
666

VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

B. RAILROAD CROSSING

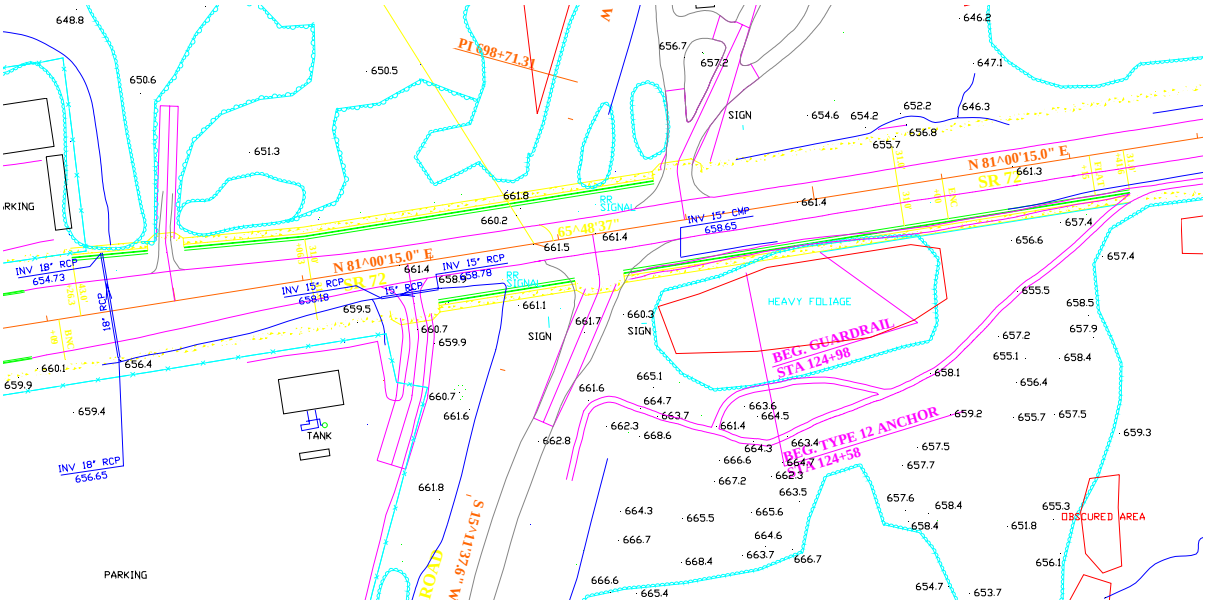
2. Value Engineering Alternative

The Value Engineering Team recommends discussing the option of terminating the CSX spur line just north of SR 72 with the Railroad and the businesses that are dependent on the spur. This may be a viable option if the business(es) that use this spur line south of the SR 72 are willing to be relocated at the Department's expense.

Removal of the railroad crossing would improve traffic operations and reduce risks associated with railroad crossings.

For a rough cost comparison, the Value Engineering Team made the following assumptions:

1. Land costs are $4,000/acre for 5 – 50 acre parcels.
2. Only one business will have to be relocated at a cost of $200,000.
3. The land and buildings vacated by the business will be saleable to others who will not require a spur line.
4. Construction of a new railroad crossing will be approximately $300,000.



VE ALTERNATIVE REMOVAL OF CSX SPUR

III. TRAFFIC CONTROL
B. RAILROAD CROSSINGS
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
RAILROAD CROSSINGS	EA	$300,000.00	1.0	$300,000	0.0	$0
SUBTOTAL				**$300,000**		**$0**
INFLATION (5% FOR 2 YEARS)	19.41%			$58,216		$0
TRAFFIC CONTROL/MOT	0.0%			$0		$0
CONTINGENCY	10%			$30,000		$0
BUSINESS RELOCATION	EA	$200,000.00	0	$0	1.0	$200,000
RIGHT-OF-WAY	AC	$4,000.00	0	$0	5.0	$020,000
GRAND TOTAL				**$388,216**		**$220,000**

POSSIBLE SAVINGS: $168,216

VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

C. DETOURS/ROAD CLOSINGS

1. "As Proposed"

"As Proposed"

The following SR 72 intersections will be closed and traffic detoured in order to construct SR 72 and the intersection.

STAGE 1	STAGE 2	STAGE 3
CR 394	CR 41	JENKINS ROAD
CR 279	CR 24	
CR 278	CR 44	
CR 45		
CR 47		
CR 304		
CR 296		
CR 369		
CR 245		

ROAD CLOSURE & DETOURS

These intersection closures will cause motorists to travel circuitous routes to get to their destinations and may cause difficult access for some businesses.

III. TRAFFIC CONTROL

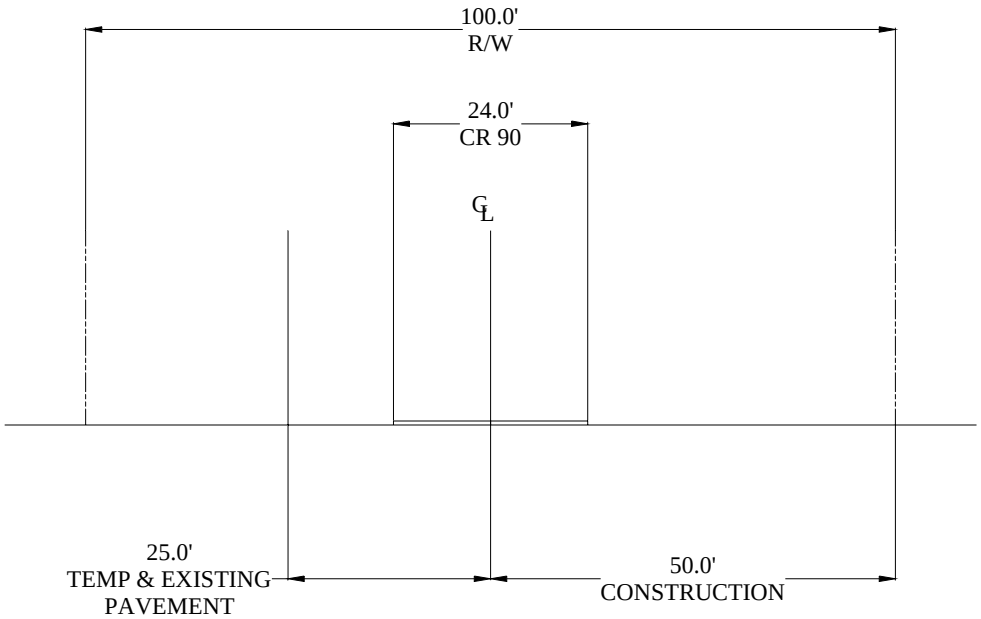
C. DETOURS/ROAD CLOSINGS

2. Value Enhancement Alternative

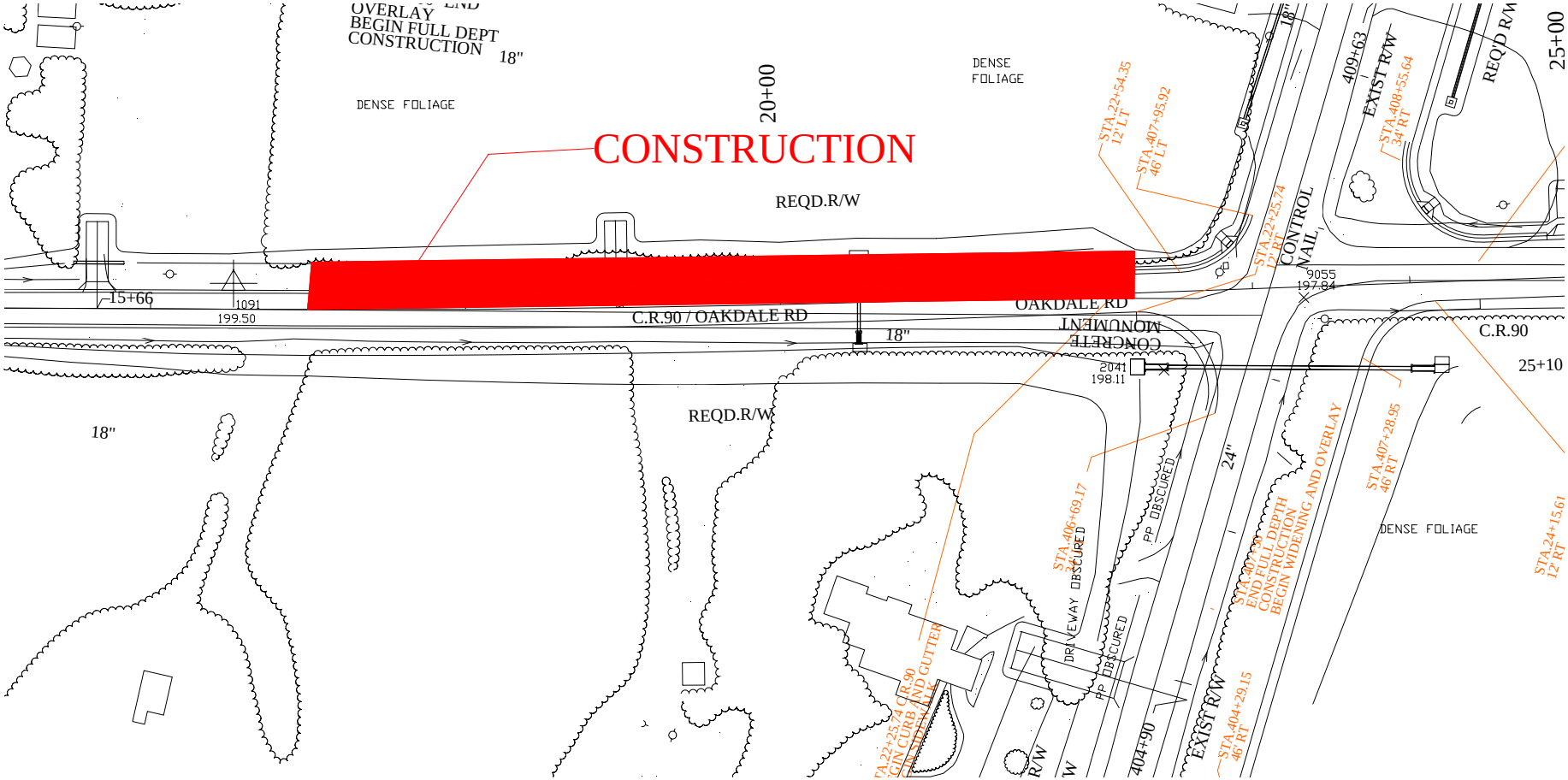
The Value Engineering Team recommends constructing the cross roads in two phases using 13’ to 25’ of temporary pavement outside of each phase as shown below. In Phase I, one lane would be widened with temporary pavement to a width of 25’ to accommodate two-way traffic. Traffic would be diverted to the existing and widened lane while the opposite lane and temporary pavement are constructed.

Traffic is then diverted to the newly constructed westbound lane and the temporary widening while the eastbound lane is constructed at its lower grade. When the eastbound lane has been constructed the temporary pavement will be removed.

Temporary pavement would consist of 6” GAB and 1.5” of asphalt.



PHASE I MOT

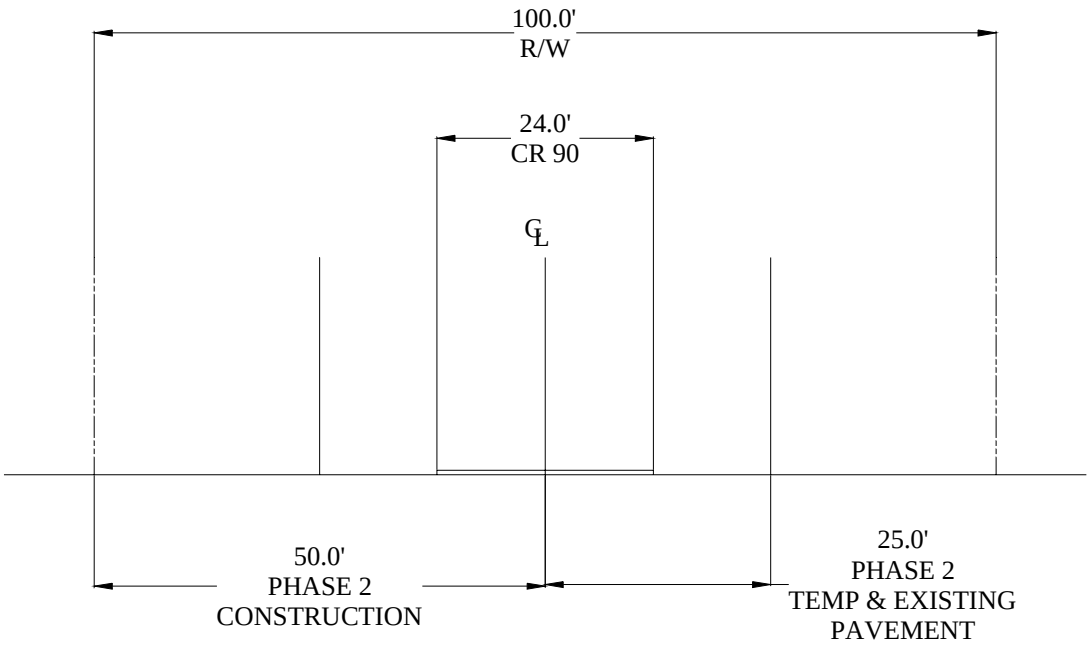

CONSTRUCTION
OVERLAY
BEGIN FULL DEPT
CONSTRUCTION
18"
DENSE FOLIAGE
20+00
DENSE
FOLIAGE
REQD.R/W
15+66
1091
199.50
C.R.90 / OAKDALE RD
OAKDALE RD
18"
CONCRETE
MONUMENT
2041
198.11
REQD.R/W
18"
STA.22+54.35
12' LT
STA.407+95.92
46' LT
STA.22+25.74
12' RT
CONTROL
NAIL
9055
197.84
409+63
EXIST R/W
STA.408+55.64
34' RT
REQ'D R/W
25+00
C.R.90
25+10
24"
PP OBSCURED
STA.406+69.17
34' LT
DRIVEWAY OBSCURED
PP OBSCURED
STA.407+30
END FULL DEPTH
CONSTRUCTION
BEGIN WIDENING AND OVERLAY
STA.407+28.95
46' RT
DENSE FOLIAGE
STA.24+15.61
12' RT
STA.22+25.74 C.R.90
BEGIN CURB AND GUTTER
404+90
EXIST R/W
STA.404+29.15
46' RT

PHASE I

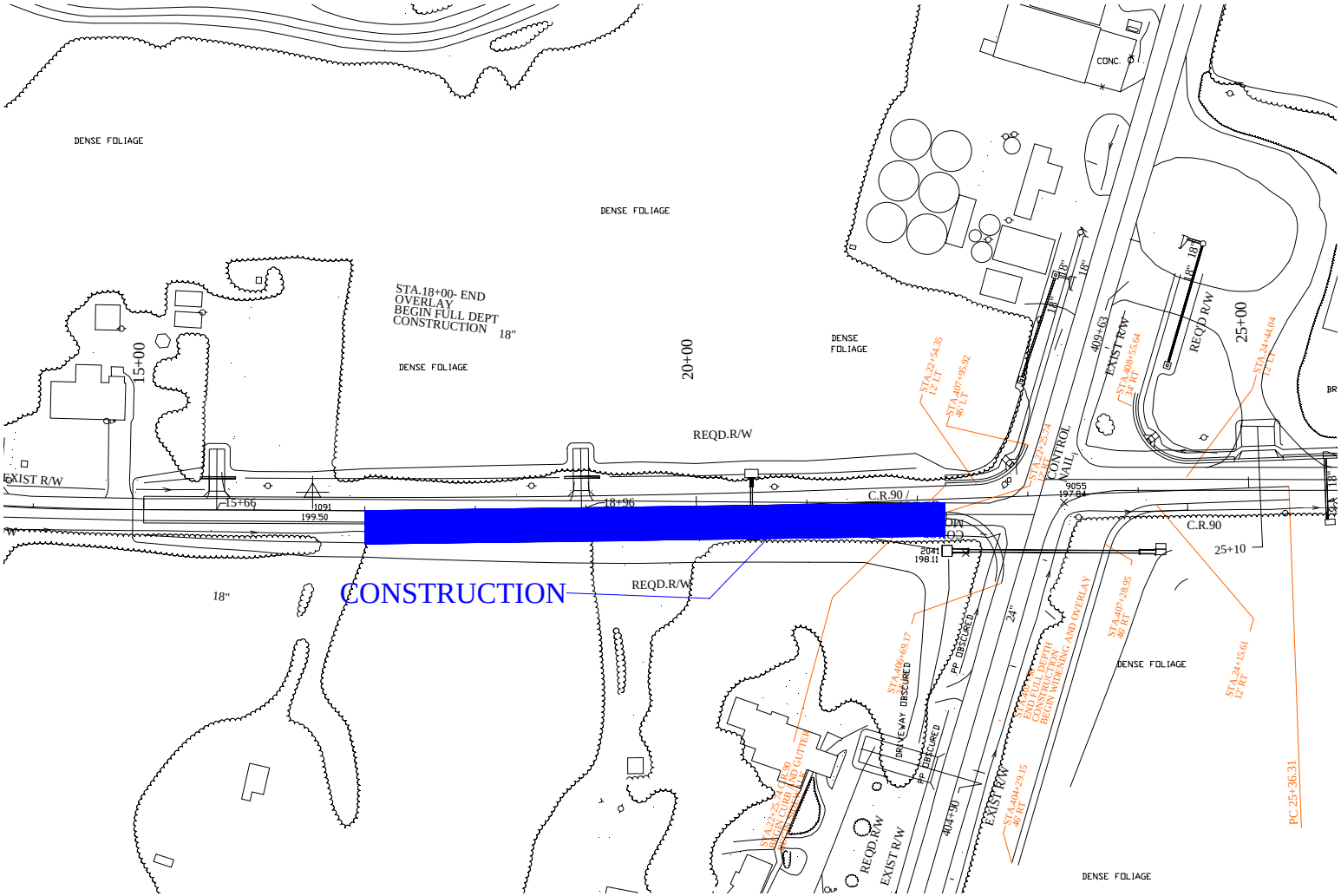
III. TRAFFIC CONTROL

C. DETOURS/ROAD CLOSINGS

2. Value Enhancement Alternative (continued)



PHASE 2 MOT


DENSE FOLIAGE
DENSE FOLIAGE
STA.18+00- END OVERLAY BEGIN FULL DEPT CONSTRUCTION
18"
DENSE FOLIAGE
DENSE FOLIAGE
15+00
20+00
25+00
REQD.R/W
EXIST R/W
15+66
1091
199.50
18+96
C.R.90
C.R.90
25+10
CONSTRUCTION
REQD.R/W
18"
CONC.
409+63
EXIST R/W
REQD R/W
CONTROL NAIL
9055
197.84
2041
198.11
24"
DRIVEWAY OBSCURED
PP OBSCURED
PP OBSCURED
404+90
EXIST R/W
REQD.R/W
EXIST R/W
DENSE FOLIAGE
DENSE FOLIAGE
PC 25+36.31

PHASE II

III. TRAFFIC CONTROL
B. DETOURS/ROAD CROSSINGS
VALUE ENHANCEMENT ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
TEMPORARY PAVEMENT 6" GAB/1.5" ASPHALT	SY	$12.50	0.0	$0	27,733.3	$346,666
DETOURS	EA	$5,000.00	13.0	$65,000	0.0	$0
SUBTOTAL				**$65,000**		**$346,666**
INFLATION (5% FOR 2 YEARS)	10.25%			$6,663		$35,533
TRAFFIC CONTROL/MOT	0.0%			$0		$0
CONTINGENCY	10%			$6,500		$34,666
RIGHT-OF-WAY	AC	$10,000.00		$0		$0
GRAND TOTAL				**$78,163**		**$416,865**

POSSIBLE COST INCREASE: **$338,702**

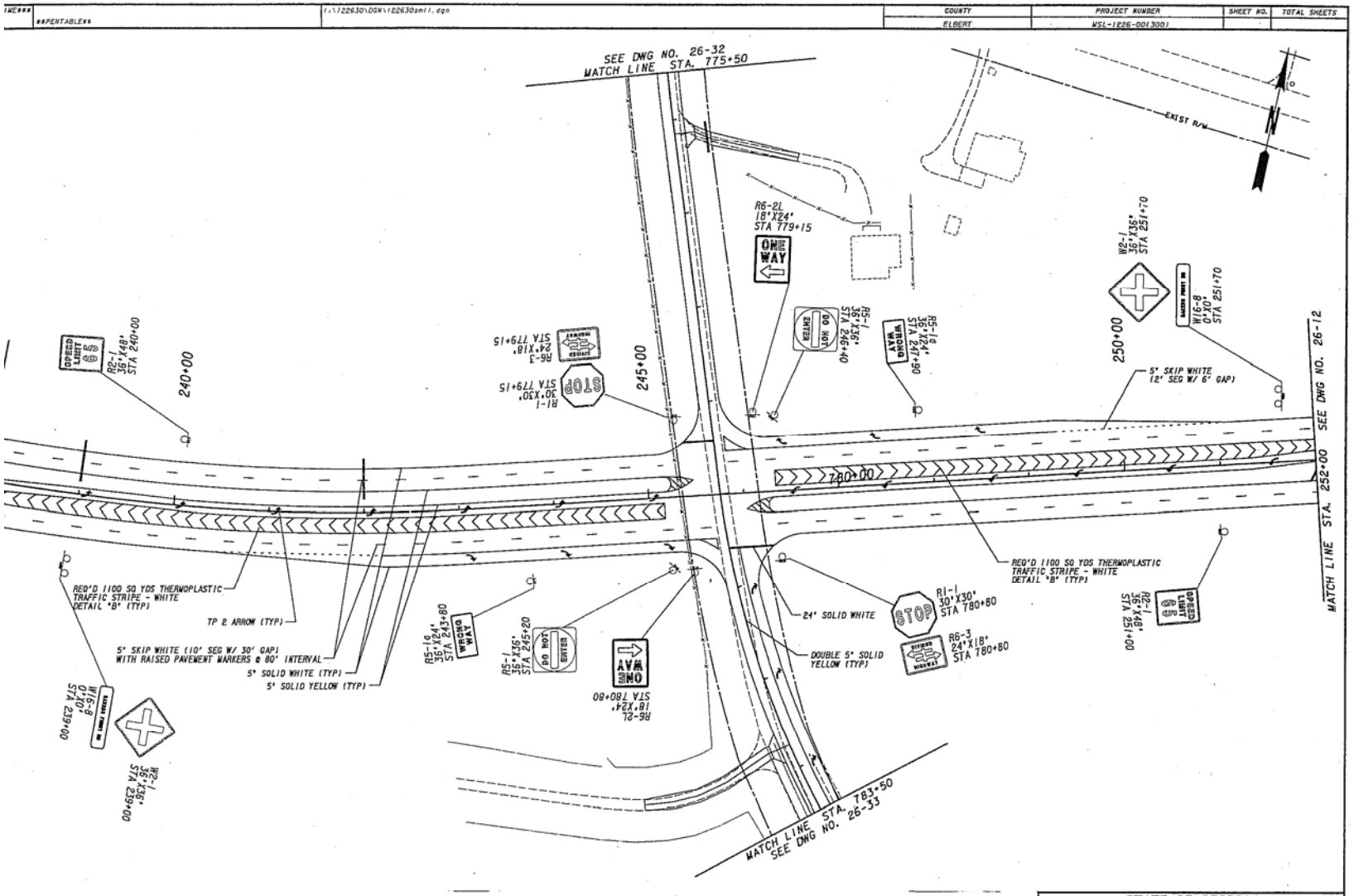
VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

D. SIGNING AND MARKING

1. "As Proposed"

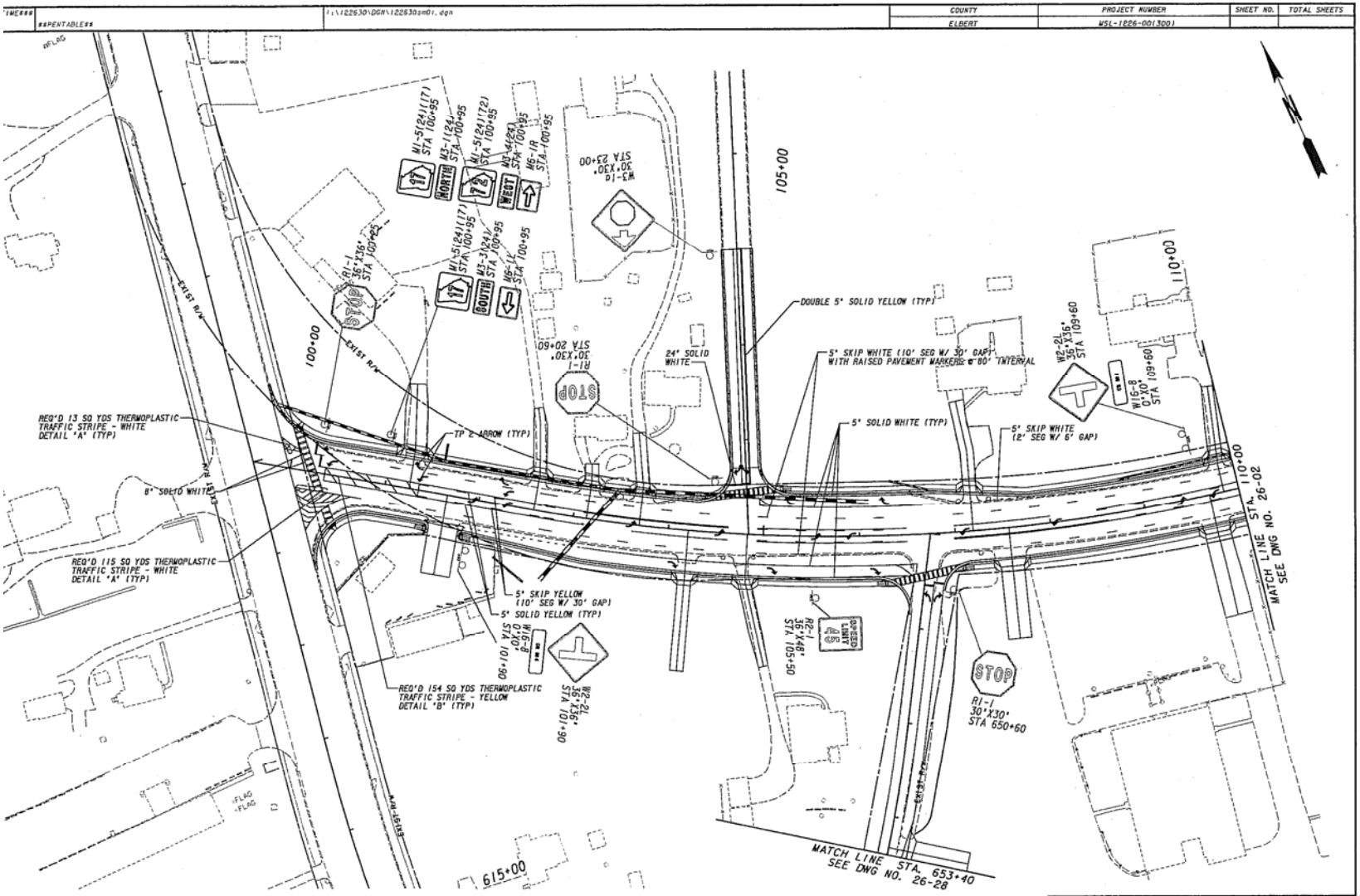
The proposed signing and marking plans for project MSL-1226 (300) were presented for review to the study team. The *MUTCD* and Georgia Department of Transportation requirements are to be adhered to in the placement and application of these traffic control devices.



III TRAFFIC CONTROL

INTERSECTION SIGNING

AS PROPOSED


COUNTY
ELBERT
PROJECT NUMBER
MSL-1226-00(300)
SHEET NO.
TOTAL SHEETS
DOUBLE 5" SOLID YELLOW (TYP)
5" SKIP WHITE (10' SEG W/ 30' GAP) WITH RAISED PAVEMENT MARKERS @ 80' INTERVAL
24" SOLID WHITE
5" SOLID WHITE (TYP)
5" SKIP WHITE (2' SEG W/ 6' GAP)
TP 2 ARROW (TYP)
REQ'D 13 SQ YDS THERMOPLASTIC TRAFFIC STRIPE - WHITE DETAIL 'A' (TYP)
8" SOLID WHITE
REQ'D 115 SQ YDS THERMOPLASTIC TRAFFIC STRIPE - WHITE DETAIL 'A' (TYP)
5" SKIP YELLOW (10' SEG W/ 30' GAP)
5" SOLID YELLOW (TYP)
REQ'D 154 SQ YDS THERMOPLASTIC TRAFFIC STRIPE - YELLOW DETAIL 'B' (TYP)
MATCH LINE STA. 110+00 SEE DWG NO. 26-02
MATCH LINE STA. 653+40 SEE DWG NO. 26-28
STOP
R1-1 30"X30" STA 650+60
R2-1 36"X48" STA 105+50
W16-8 30"X30" STA 109+60
W2-2L 36"X36" STA 109+60
W3-1R 30"X30" STA 23+00
R1-1 30"X30" STA 20+60
W16-9 30"X30" STA 101+90
W2-2R 36"X36" STA 101+90
R1-1 36"X36" STA 100+95
W1-5(24)(17) STA 100+95
W3-1(24) STA 100+95
W1-5(24)(72) STA 100+95
W3-4(24) STA 100+95
W6-1R STA 100+95
W6-1L STA 100+95
NORTH
WEST
SOUTH
EXIST R/W
100+00
105+00
110+00
615+00
FLAG
III TRAFFIC CONTROL
CROSSWALK MARKINGS
AS PROPOSED
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN
SIGNING AND MARKING PLANS
SR 72 ELBERT COUNTY
DRAWING No.
26-01

VII. DEVELOPMENT PHASE

III. TRAFFIC CONTROL

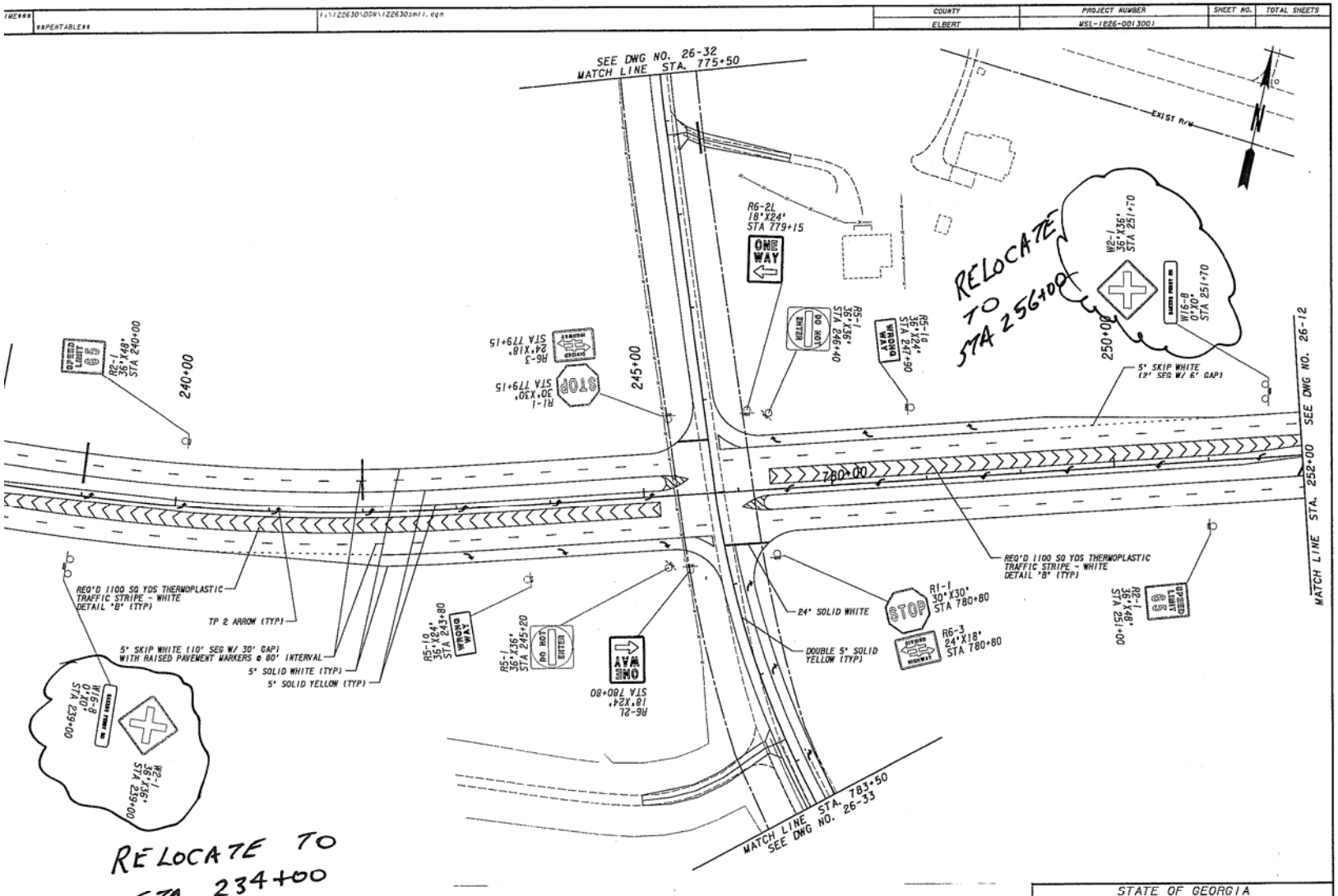
D. SIGNING AND MARKING

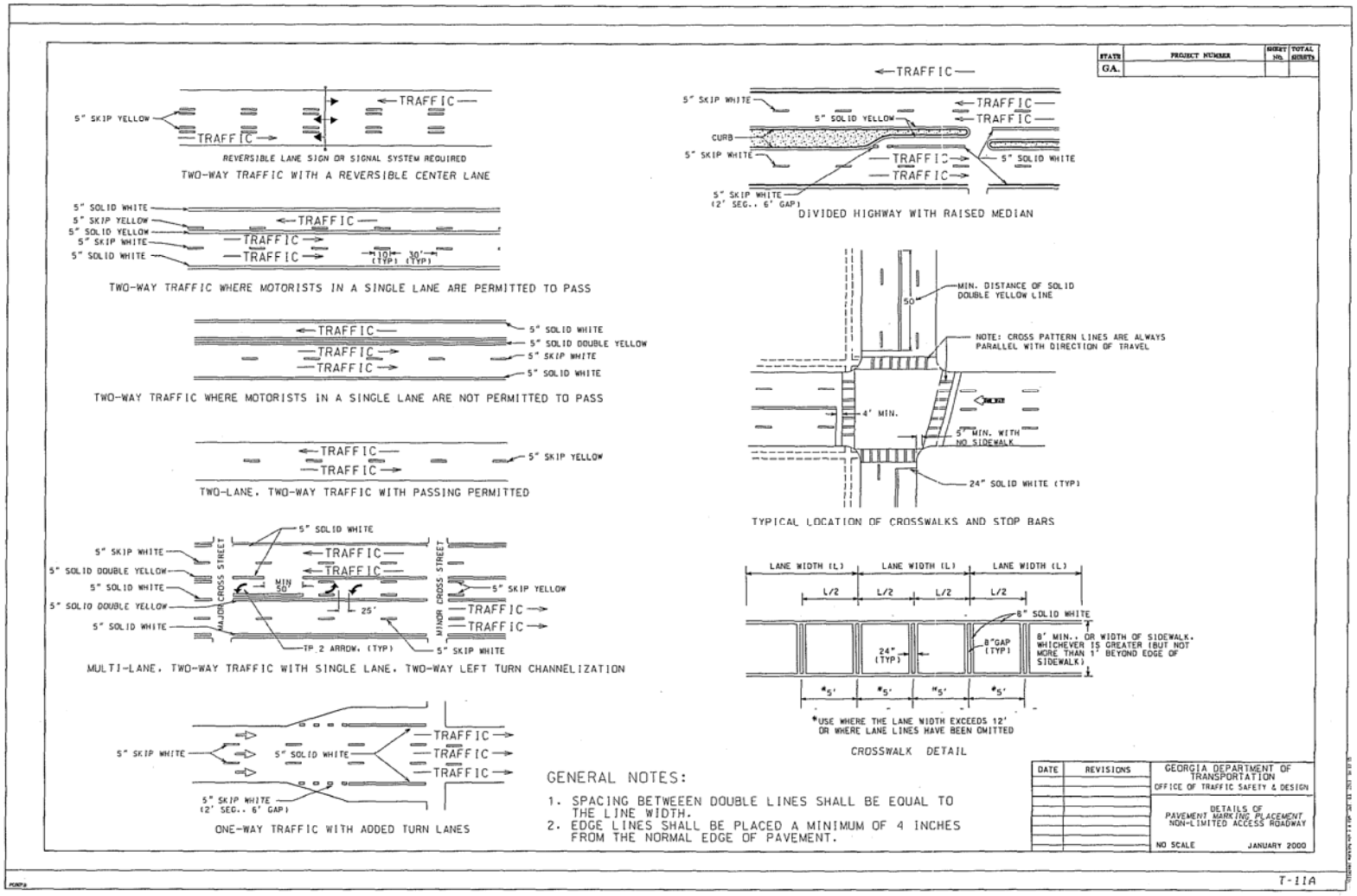
2. Value Engineering Alternative

The placement of advance warning signs is a very important consideration for the safe operation of the roadway. The *MUTCD* requires that warning signs be placed at such a location to allow the motorist to perceive and react to the information. This is called the PIEV time and is described in Section 2C.05 of the *MUTCD*. The proposed plans include the placement of intersection signs with accompanying road name signs in advance of the intersections. These signs are generally placed between 600' and 700' from the intersection. Left turn lanes for divided highways begin some 900' to 1,000' from the intersection due to the use of Type B median crossovers. Since the motorist needs time to perceive and react to the need to change lanes, reduce speed and enter the turn lane, the intersection warning signs should be installed 300' to 500' before the beginning of the left turn lane.

Pavement markings are also very important to the safety of the user and need to be properly installed. There are four intersections on the proposed project where crosswalks are to be placed: 1) SR 17, 2) an unnamed street, 3) Wal-Mart's driveway and, 4) Manor Country Lane. The outside lines of marked crosswalks are an extension and straight-line connection of the adjacent sidewalks and these may be skewed to the vehicular travel lanes. Georgia Department of Transportation Construction Detail T-11A requires that the interior cross pattern lines are always parallel to the travel lines.

The value engineering study team recommends that the above two changes be made to the signing and marking plans for project MSL-1226 (300) Elbert.


COUNTY
ELBERT
PROJECT NUMBER
MSL-1826-00(300)
SHEET NO.
TOTAL SHEETS
SEE DWG NO. 26-32
MATCH LINE STA. 775+50
EXIST R/W
R6-2L
18"X24"
STA 779+15
ONE WAY
RELOCATE TO STA 256+00
W2-1
36"X36"
STA 251+70
W16-8
0"X0"
STA 251+70
R5-1B
36"X24"
STA 247+90
R5-1
36"X36"
STA 246+40
R6-3
24"X18"
STA 779+15
R1-1
30"X30"
STA 779+15
STOP
R2-1
36"X48"
STA 240+00
240+00
245+00
250+00
5" SKIP WHITE
(2' SEG W/ 6' GAP)
780+00
SEE DWG NO. 26-12
MATCH LINE STA. 252+00
REQ'D 1100 SQ YDS THERMOPLASTIC
TRAFFIC STRIPE - WHITE
DETAIL "B" (TYP)
TP 2 ARROW (TYP)
5" SKIP WHITE (10' SEG W/ 30' GAP)
WITH RAISED PAVEMENT MARKERS @ 80' INTERVAL
5" SOLID WHITE (TYP)
5" SOLID YELLOW (TYP)
R5-1B
36"X24"
STA 243+80
R5-1
36"X36"
STA 245+20
DO NOT ENTER
R6-2L
18"X24"
STA 780+80
24" SOLID WHITE
DOUBLE 5" SOLID
YELLOW (TYP)
R1-1
30"X30"
STA 780+80
R6-3
24"X18"
STA 780+80
R2-1
36"X48"
STA 251+00
W16-8
0"X0"
STA 259+00
W2-1
36"X36"
STA 259+00
RELOCATE TO
STA. 234+00
MATCH LINE STA. 783+50
SEE DWG NO. 26-33
III TRAFFIC CONTROL
INTERSECTION SIGNING
VE ALTERNATIVE
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: CONSULTANT DESIGN
SIGNING AND MARKING PLANS
SR 72 ELBERT COUNTY
DRAWING NO.
26-11



III TRAFFIC CONTROL

CROSSWALK MARKINGS

VE ALTERNATIVE

VII. DEVELOPMENT PHASE

IV. CONTRACTOR WORK HOURS

A. CLOSURES

1. "As Proposed"

There were no restrictions presented by the consultant for lane closures. Therefore, any lane closures would be at the contractor's discretion. This would also mean that there are no restrictions on closures for weekends, holidays, etc.

VII. DEVELOPMENT PHASE

IV. CONTRACTOR WORK HOURS

A. CLOSURES

2. Value Engineering Alternative

The study team recommends that restricted work hours be included in this project to limit the times that the contractor can interfere with traffic or have lane closures. These restrictions include no lane closures in the AM peak between 7:00 and 9:00 and also no lane closures in the PM peak between 4:00 and 6:00. There should also be a requirement that there be no work on Saturday, Sunday or holidays.

VII. DEVELOPMENT PHASE

V. CONSTRUCTION TIME

A. LENGTH OF TIME

1. "As Proposed"

There was no length of construction time proposed by the consultant at the briefing for this project.

VII. DEVELOPMENT PHASE

V. CONSTRUCTION TIME

A. LENGTH OF TIME

2. Value Engineering Alternative

During the discussion of the construction of this project it was felt that the grading and staging would be the controlling factors for this project. The earthwork should take no more than 9 to 12 months to complete the rough grading. The remainder of the work should take no more than 12 months. Therefore, it is the recommendation of the study team that the overall project time be 24 months.

VII. DEVELOPMENT PHASE

V. CONSTRUCTION TIME

B. ROAD CLOSURES

1. "As Proposed"

There were no restrictions or requirements for the side roads presented by the consultant at the briefing for this project.

VII. DEVELOPMENT PHASE

V. CONSTRUCTION TIME

B. ROAD CLOSURES

2. Value Engineering Alternative

The side roads to this project serve the public. It is the strong opinion of the study team that the public should be inconvenienced as little as possible. Therefore, it is the recommendation of the study team that any side roads that require closing due to construction should be closed for a minimum of 14 days. Closures should only be allowed if there are readily available detours for the local traffic. Additionally, the contractor should be required to install informational signage two weeks in advance to notify the residents of the area of the impending closure. And finally, there should be disincentives included in the *Special Provisions* to establish a daily cost of going over the 14-day restriction.

VII. DEVELOPMENT PHASE

V. CONSTRUCTION TIME

C. FIVE LANE SECTION

1. "As Proposed"

A length of construction time was not proposed for this project by the consultant. Additionally, there were no locations that were recommended for intermediate completion dates.

V. CONSTRUCTION TIME

C. FIVE LANE SECTION

2. Value Engineering Alternative

Most of the corridor of SR 72 is rural in nature except the western section of this project. This is an urban section with several businesses that could be adversely affected by the construction. There is the consideration for the number of utilities that must be relocated in this area and also the fact that there will be a closed drainage system. However, the study team feels that traffic should be inconvenienced as short a time as possible and also that special effort needs to be taken to not impact adjoining businesses. It is therefore the further recommendation of the study team that an intermediate completion date of 9 months be included in the contract requirements for the completion of that portion of this project from the SR 17 intersection to the end of the curb and gutter section at CR 45/Mobley Hill Road. The work would be considered completed when traffic is able to use all proposed lanes even if final topping is not in place. The beginning of this restricted time constraint would be the actual start of any work that impedes traffic within this area.

VII. DEVELOPMENT PHASE

VI. STAGE CONSTRUCTION

A. NUMBER OF STAGES

1. "As Proposed"

The proposed project is separated into 3 stages. The first stage would be the construction of two new lanes shifting from right to left of the existing roadway.

The second stage would be the relocation of traffic onto these new lanes and the construction of two new lanes, again to the right or left of the traveled lanes. Paved, two-lane crossovers of adequate design for smooth traffic flow and operation would accomplish the shifts from side to side.

The third stage would be the removal of these crossovers.

VII. DEVELOPMENT PHASE

VI. STAGE CONSTRUCTION

A. NUMBER OF STAGES

1. Value Engineering Alternative

Stage 3 consists primarily of removing pavement placed earlier in the construction process or original paving to be resurfaced. It therefore seems that this stage could be incorporated into Stage 2, reducing the project to 2 phases.

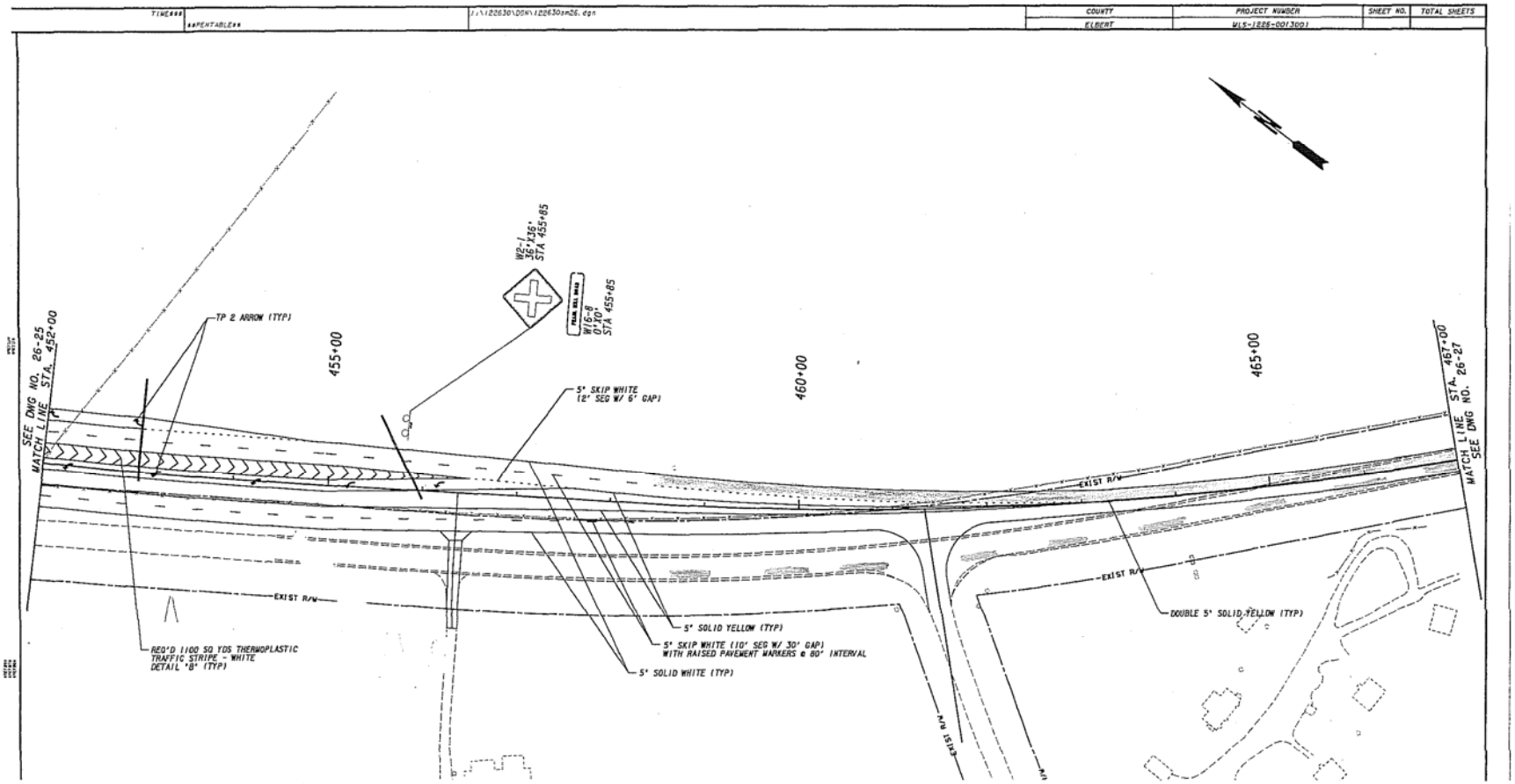
VII. DEVELOPMENT PHASE

VI. STAGE CONSTRUCTION

B. PROJECT TERMINUS

1. "As Proposed"

Project MSL-1226 (300) is proposed to end approximately 2,000' east of CR 45/Pearl Mill Road. The project will end with the westbound side tapering into the existing roadway. This is essentially becoming a crossover. There follows a sketch of the project terminus.



LEGEND

WESTBOUND LANE

EASTBOUND LANE

VI STAGE CONSTRUCTION

B. PROJECT TERMINUS

AS PROPOSED

VII. DEVELOPMENT PHASE

VI. STAGE CONSTRUCTION

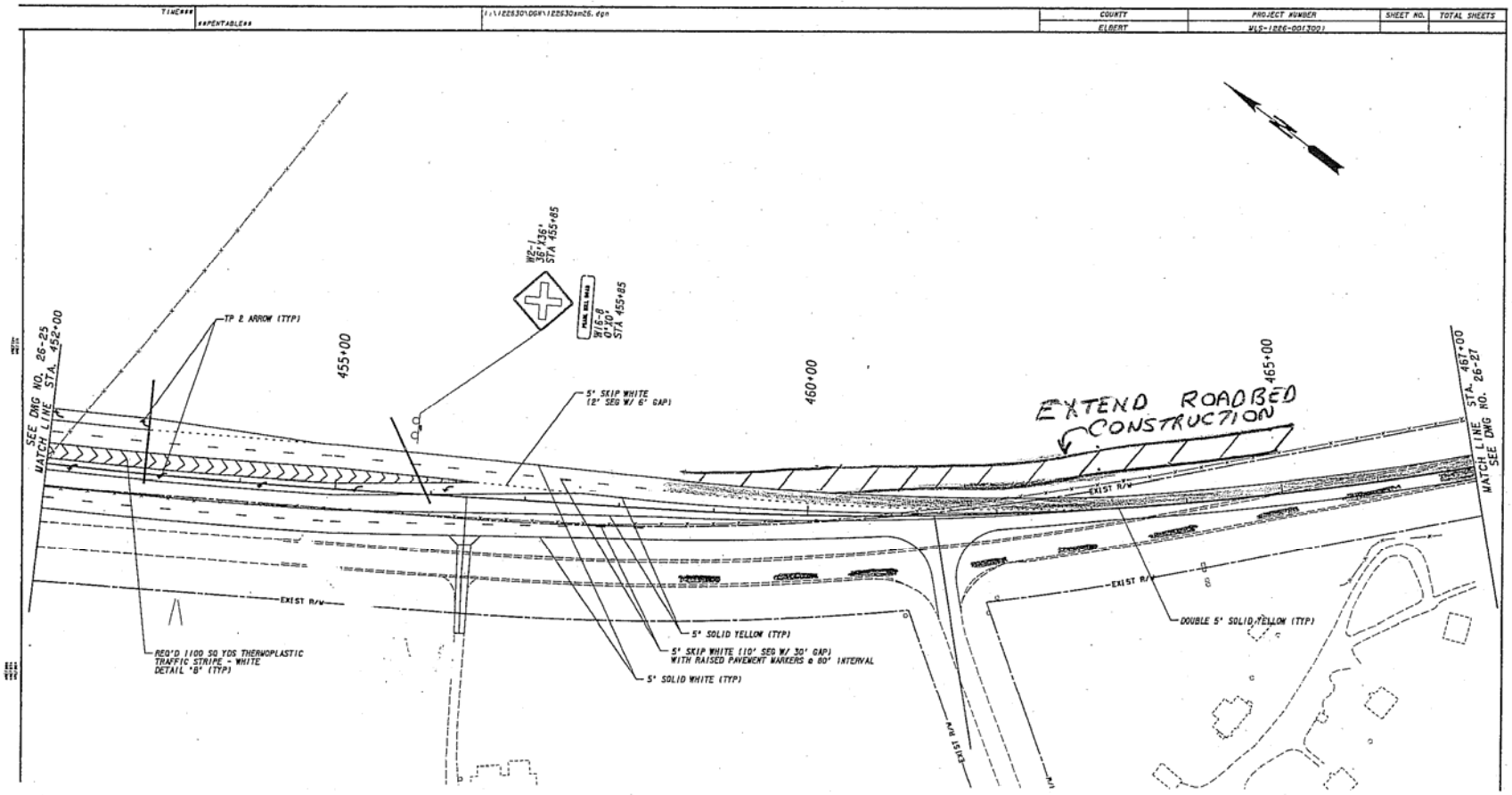
B. PROJECT TERMINUS

2. Value Enhancement Alternative

MSL-1226 (300) is part of the GRIP program in Georgia. As such there is another project already in the design process to the east of this project. With this future project tying directly to the study project, every effort should be made to not duplicate construction work or unnecessarily impact traffic on this future project.

It is therefore the recommendation of the study team that the construction of the terminus for project MSL-1226 (300) be modified to address this concern. The westbound roadbed needs to be constructed through the subgrade to approximately Sta. 465+00. There would be an estimated 1,000 yards of additional embankment necessary to accomplish the construction of the roadbed in the future westbound lanes. This would be trucked material and a higher cost of $6 per yard was used in the computations for this additional work. Graded aggregate base could then be placed to within 50' of the completed roadbed. The asphaltic concrete 19mm and 25mm could then be placed in staggered lifts and left so that they could be easily joined in the future.

Adding the above-described work would allow construction on the future project to proceed without a shift of traffic or unnecessary lane closures. This value enhancement addition to the study project would cost approximately $33,490. However, this would reduce the future project by a comparable amount.



LEGEND

WESTBOUND LANE

EASTBOUND LANE

CONSTRUCTION EXTENSION

VI STAGE CONSTRUCTION

B. PROJECT TERMINUS

VE ALTERNATIVE

VI. STAGE CONSTRUCTION
B. PROJECT TERMINUS
VALUE ENHANCEMENT ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
GRADING	CY	$6.00	0.0	$0	1,000.0	$6,000
GRADED AGGREGATE BASE	TN	$14.10	0.0	$0	1,410.0	$19,881
ASPHALTIC CONCRETE 25MM	TN	$40.00	0.0	$0	350.0	$14,000
ASPHALTIC CONCRETE 19MM	TN	$40.00	0.0	$0	200.0	$8,000
SUBTOTAL				**$0**		**$47,881**
MOBILIZATION (THIS IS SUB+CONTIN x%=)	0.0%			$0		$0
TRAFFIC CONTROL/MOT	0.0%			$0		$0
CONTINGENCY	10%			$0		$4,788
INFLATION (3% FOR 6 YEARS)	3%			$0		$1,436
GRAND TOTAL				**$0**		**$54,105**

POSSIBLE COST INCREASE: **$54,490**