



# I-75 Reversible Lanes and I-575 Reversible Lanes

*NH000-0073-03(242); NH000-0575-01(028); CSNHS-0008-00(256)*  
*P.I. Nos.: 714130; 0008256; 713640; 0001919;*  
*0006417; 0006418; 0006419*  
Cobb and Cherokee Counties, Georgia

## Value Engineering Study Report

December 2009

*Designers*



*Value Engineering Consultant*





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Re: NH000-0073-03(242); NH000-0575-01(028); CSNHS-0008-00(256)  
P.I. Nos.: 714130; 0008256; 713640; 0001919; 0006417; 0006418; 0006419  
I-75 Reversible Lanes and I-575 Reversible Lanes  
Value Engineering Study Report

Date:  
December 30, 2009

Dear Mr. Sanders:

Lewis & Zimmerman Associates, Inc. is pleased to submit two hard copies and one electronic copy of the referenced value engineering (VE) study report documenting the study that took place on December 7-11, 2009. The objective of the VE effort was to identify opportunities to enhance the value of the project and costs.

Contact:  
Howard Greenfield

Phone:  
301.984.9590 x 20

The VE team developed 19 alternatives with identifiable cost saving potential. Of particular interest is Alternative Number G-4 which moves the two managed lanes along I-75 from the west side of the highway to the east side in unused GDOT right-of-way between Gresham Road and North Marietta Parkway. This removes the managed lanes from railroad and wetlands areas eliminating the need for bridges. It also makes the connection to the single managed lanes on I-75 and I-575 north of the interchange easier to construct. Approximately \$23 million can be saved by adopting this alternative.

Email:  
hgreenfield@lza.com

Our ref:  
LZ083350.0000

Other alternatives provide options for reducing the extent of the bridges, walls and pavement which constitute 68% of the project's total construction cost.

We thank you for your assistance during the course of the VE team's work. Please do not hesitate to call upon us if you or any of the reviewers have any questions regarding the information presented in this report.

Sincerely yours,

LEWIS & ZIMMERMAN ASSOCIATES, INC.  
an ARCADIS company

A handwritten signature in black ink that reads "Howard B. Greenfield".

Howard B. Greenfield, PE, CVS  
Vice President

Attachment

**Taking the Chance out of Change**

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## EXECUTIVE SUMMARY

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### INTRODUCTION

This value engineering (VE) study report documents the events and results of the VE study conducted by Lewis & Zimmerman Associates, Inc. for the Georgia Department of Transportation (GDOT). The subjects of the study were the following projects:

Project No.:	NH000-0073-03(242)	Cobb County
	I-75 Reversible Lanes	
Project No.:	NH000-0575-01(028)	Cobb/Cherokee County
	I-575 Reversible Lanes	
Project No.:	CSNHS-0008-00(256)	Cobb/Cherokee County
PI Nos.:	714130; 0008256; 713640; 0001919; 0006417; 0006418; 0006419	

The study was conducted December 7-11, 2009, at GDOT Headquarters in Atlanta, GA using Preliminary Design Documents prepared for GDOT by the Georgia Transportation Partners (GTP).

Comprising the study team were highway and bridge engineers, a construction specialist and a Certified Value Specialist (CVS) facilitator. The team followed the six-phase VE Job plan to guide its deliberations.

- Information Gathering Phase
- Function Analysis Phase
- Creative Idea Generation Phase
- Evaluation/Judgment of Creative Ideas Phase
- Alternative Development Phase
- Presentation of Results Phase

### PROJECT DESCRIPTION

This project constructs managed, reversible lanes along I-75 from the I-285 interchange north of Atlanta north to Hickory Grove Road in Cobb County and along I-575 from the I-75 interchange in Cobb County north to Sixes Road in Cherokee County. There will be two reversible lanes on I-75 starting at the I-75 HOV lanes at the I-285 interchange. The northbound and southbound HOV lanes will merge into one lane north of the interchange and bridge over the I-75 southbound lanes to the west side of I-75. Ramps to and from I-285 eastbound and westbound will merge into one lane and then meet with the I-75 lane to form the new two-lane section that will proceed north. The roadway will consist of two, 12-ft.-wide lanes, a 10-ft.-wide shoulder on the west side and a 4-ft.-wide shoulder on the east side.

The two managed lanes will bridge over the I-75/Windy Hill Road interchange, return to an at-grade section and then bridge over Terrill Mill Road. On and off ramps to the managed lanes will be provided at Terrill Mill Road. The managed lanes will return to grade level and continue north,

bridging over the south portion of Rottenwood Creek and then the Delk Road interchange on one continuous bridge. North of the I-75 southbound off-ramp to Delk Road, the managed lanes will again return to grade level. The road will continue north and bridge over the north portion of Rottenwood Creek and the wetland areas further north.

After returning to grade, the roadway will rise up again to bridge over more wetlands and then South Marietta Parkway, moving slightly west at the interchange and then back east to be alongside I-75 again. The roadway will return to grade level north of the interchange and continue north before bridging over SR 120/Roswell Road where exit and entry ramps to the managed lanes will be constructed. The roadway continues on a bridge structure over Gresham Road and the ramp from North Marietta Parkway to I-75 southbound, returns to an embankment section and then bridges over North Marietta Parkway interchange and then the I-75 southbound exit ramp to North Marietta Parkway. From north of the exit ramp, it proceeds at-grade under Allgood Road and further north to where the Georgia Northeastern Railroad Spur parallels I-75.

From this point, the roadway rises up on a bridge structure which continues across the Georgia Northeastern Railroad and the Canton Road Connector/Hwy 5 interchange; moving slightly west as it crosses the interchange. It continues north of the interchange on a bridge structure and crosses into the I-75 median where it returns to grade until the I-575 interchange. At the interchange, one lane turns due north and crosses I-75 northbound to become the I-575 reversible lane. The other lane continues north in the I-75 median adjacent to the northbound lanes.

The I-75 managed lane is in the median adjacent to the northbound I-75 general purpose lanes. The lane will be 12 ft. wide with a 10-ft.-wide shoulder on the inside and a 4-ft.-wide shoulder adjacent to a concrete barrier separating it from the general purpose lanes. This lane bridges over Barrett Parkway, a stream, Big Shanty Road, Chastain Road, Barrett Lakes Boulevard, Shiloh Road, and Wade Green Road. Further north it proceeds under Hickory Grove Road where it splits to connect to the general I-75 northbound and southbound lanes.

The I-575 managed lane is in the median adjacent to the northbound I-575 general purpose lanes. The lane will be 12 ft. wide with a 10-ft.-wide shoulder on the inside and a 4-ft.-wide shoulder adjacent to a concrete barrier separating it from the general purpose lanes. An entry ramp from the I-575 southbound lanes is provided south of the Barrett Parkway Bridge. Emergency exit and entry points are provided about every one-half mile. An exit to I-575 northbound is provided just north of the Barrett Parkway Bridge. Bridge widenings are provided over creeks, Big Shanty Road, Chastain Road, N. Booth Road, Bells Ferry Road, Shallowford Road, Dupree Road, Town Lake Parkway, Old Pope Mill Road, and Altoona Lake. An access ramp is provided from I-575 southbound to the managed lane south of Sixes Road, the northern terminus of the project.

The project is estimated to cost about \$1.05 billion. It will be procured using a design-build-operate-maintain-finance contract with the project being turned over to the State after 50 years. Electronic toll facilities will be erected along the route to identify users having transponders in their vehicles or pictures taken of their license plates in order to collect tolls. Tolls will vary from \$.25/mile to \$1.00/mile depending upon traffic conditions. High occupancy vehicles with three or more persons will be allowed to use the managed lanes free of charge.

## CONCERNS AND OBJECTIVES

A significant amount of time and energy has been expended to bring the project to this stage of development. The extent of the managed lane configuration has been optimized but the project remains very costly to finance and construct. Construction will cause disruption of traffic on I-75, I-285, I-575 and at each of the roads that the managed lanes cross. At one point the roadway will have to be constructed adjacent to an operating railroad, which adds complexity to the project.

In order to further ensure that GDOT receives optimum value for the proposed expenditures, it engaged this VE study. The objective of the study was to identify specific changes that will improve the functionality of the managed lane concept and/or save costs. These suggested changes would then be evaluated by GDOT to determine if they should be implemented into the project.

## RESULTS OF THE STUDY

Bridges, retaining walls and paving constitute 68% of the project's cost. Thus the VE team focused its efforts on these aspects of the project. This yielded 19 alternatives with cost saving opportunities and 2 design suggestions that will either save non-quantified costs or enhance the functionality of the project. Each is summarized on the following Summary of Potential Cost Savings table, those with the greatest potential to impact the project highlighted below, and detailed in Section Two of the report. Note that all of the alternatives were developed independently, thus some are mutually exclusive or interrelated and the total cost savings achievable will be dependent upon the combined effect of those individual alternatives selected for implementation.

Placing the I-75 managed lanes on the west side of I-75 from the I-285 interchange to the I-575 interchange requires a substantial portion of the roadway to be placed on bridges to span over roadways, wetland areas and adjacent railroad tracks. Starting between Gresham Road and North Marietta Parkway there is a substantial amount of open GDOT right-of-way on the east side of I-75. To take advantage of this, Alt. No. G-4 suggests that the managed lanes cross I-75 at this location to proceed north on the east side of I-75. On this side of I-75 there are no wetlands or railroads allowing longer stretches of roadway to be placed on grade or on embankment supported by MSE walls on one side or two sides, which greatly reduces the cost of the roadway. The connection to the one-lane sections on I-75 and I-575 north of the interchange are also simplified. Building on the inside of I-75 at the interchange is also much easier than building in the median.

Alt. No. B-6 eliminates Bridge No. 4 over Windy Ridge Parkway by bringing it down to grade and adjusting the profiles of Bridge Nos. 2A, 2B, 2C, 7 and 13. In addition to eliminating the bridge, portions of the other bridges are placed on embankments formed using MSE walls which reduces bridge construction costs substantially as well as long term maintenance costs.

The current design has the I-75 managed lanes bridging over Gresham Road. The Gresham Road Bridge over I-75 can be extended and the managed lanes run under the extended bridge to eliminate part of Bridge No. 19. Although this may require detouring traffic on Gresham Road around the construction area, large cost savings can be achieved as illustrated in Alt. No. B-2.

Some wall construction can be avoided by moving the entry and exit ramps to the managed lanes at Big Shanty Road further into the I-75 median as demonstrated in Alt. No. W-1.

Two opportunities for pavement cost reduction are provided in Alt. Nos. P-1 and P-3. In the former, an 11-ft.-wide lane is used adjacent to the 10-ft.-wide shoulder to narrow the managed lane cross section where two managed lanes are provided on I-75. Since no trucks will be allowed in the managed lanes, this should not present a safety problem and the wide shoulder provides ample maneuvering room. In Alt. No. P-3, soil cement is substituted for the asphalt base under the concrete pavement to provide the desired separation at a significant reduction in cost.





# SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: I-75 REVERSIBLE LANES and I-575 REVERSIBLE LANES <i>Cobb and Cherokee Counties</i>		PRESENT WORTH OF COST SAVINGS				
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
<b>WALLS</b>						
W-1	At Big Shanty Road and I-75, move the entry and exit ramps to the reversible lane to the center of the median and delete the	\$6,053,000	\$944,000	\$5,109,000		\$5,109,000
W-2	Adjust the reversible lanes profile between South Marietta Parkway and Banberry Road to reduce the extent of the retaining walls	\$2,298,000	\$0	\$2,298,000		\$2,298,000
W-3	Adjust the reversible lanes profile on between Sta. 406+00 and Sta. 419+00 to reduce the extent of the retaining walls	\$3,276,000	\$0	\$3,276,000		\$3,276,000
<b>I-575</b>						
575-1	Move slip ramp (hot lane) at Hawkins Store Road to the north and off of the bridge over Hawkins Store Road	\$567,000	\$0	\$567,000		\$567,000
575-2	End the project on I-575 just south of the Little River Bridge by shifting the slip ramp to the south	\$3,642,000	\$0	\$3,642,000		\$3,642,000
<b>PAVEMENT</b>						
P-1	On the two-lane managed lanes section of I-75 use 11-ft.-wide lanes adjacent to the 10-ft.-wide shoulders	\$9,191,000	\$0	\$9,191,000		\$9,191,000
P-3	Underneath the concrete pavement, use 3 in. of soil-cement base in lieu of asphaltic concrete base the length of the project	\$10,192,000	\$1,625,000	\$8,567,000		\$8,567,000
P-4	Underneath the concrete pavement, delete the 3-in.-thick	\$10,192,000	\$0	\$10,192,000		\$10,192,000



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## STUDY RESULTS

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### INTRODUCTION

The results of the I-75 Reversible Lanes and I-575 Reversible Lanes project value engineering study portray the benefits that can be realized by GDOT and the ultimate users of the facility. The results will directly affect the project's final design and GDOT staff will be tasked with determining the disposition of each alternative so that the request for proposal to obtain a design-build-operate-maintain-finance contractor can incorporate the value enhancing ideas presented by the VE team.

During the VE workshop, many ideas for potential value enhancement were conceived and evaluated by the team for technical merit, applicability to the project, implementability considering the project's status, and the ability to meet GDOT's project value objectives including:

- Save construction costs
- Simplify construction
- Do not impact the project's schedule
- Reduce impact on maintenance of traffic during construction
- Enhance the purpose and need of the project
- Enhance the safety of the completed facility
- Reduce environmental impacts

Research performed on those ideas considered to have the potential to enhance the value of the project resulted in the development of individual alternatives identifying specific changes to the project as a whole, or individual elements that comprise the project. These may be in the form of VE alternatives (accompanied by cost estimates) or design suggestions (without cost estimates). For each alternative developed, the following information is provided:

- A summary of the original design,
- A description of the proposed change to the project,
- Sketches and design calculations, if appropriate,
- A capital cost comparison and life cycle discounted present worth cost comparison of the alternative and original design (where appropriate),
- An evaluation of the advantages and disadvantages of the alternative, and
- A brief narrative to compare the original design and the proposed change and provide a rationale for implementing the change into the project.

The capital cost comparisons used unit quantities contained in the project cost estimate prepared by the designers, whenever possible. If prices were not available, cost databases from GDOT and team members were consulted. Each design suggestion contains the same information as the VE alternatives, except that no cost information is included. Design suggestions are presented to bring attention to areas of the design that, in the opinion of the VE team, should be changed for reasons other than cost. Examples of these reasons may be to improve traffic operations, reduce

maintenance, improve constructability, improve safety, and reduce project risk. In addition, some ideas cannot be quantified in terms of cost with the design information provided; these are also presented as design suggestions and are intended to improve the quality of the project.

Each alternative or design suggestion developed is identified with an alternative number (Alt. No.) that can be tracked through the value engineering process, thus facilitating referencing among the Creative Idea Listing and Evaluation worksheets, the alternatives, and the Summary of Potential Cost Savings table. The Alt. No. contains one of the following letter prefixes indicating the project element being addressed:

<b>PROJECT ELEMENT</b>	<b>PREFIX</b>
Bridge	B
Walls	W
I-575 Managed Lanes	575
Pavement	P
General	G

Summaries of the alternatives and design suggestions are provided on the Summary of Potential Cost Savings table. The table is divided into project elements for the reviewer's convenience and is used to divide the alternatives portion of the report. The complete documentation of the developed alternatives and design suggestions follows the Summary of Potential Cost Savings tables.

## **KEY ISSUES**

A significant amount of time and energy has been expended to bring the project to this stage of development. The extent of the managed lane configuration has been optimized but the project remains very costly to finance and construct. Construction will cause disruption of traffic on I-75, I-285, I-575 and at each of the roads that the managed lanes cross. At one point, the roadway will have to be constructed adjacent to an operating railroad, which adds complexity to the project.

## **STUDY OBJECTIVES**

In order to further ensure that GDOT receives optimum value for the proposed expenditures, it engaged this VE study. The objective of the study was to identify specific changes that will improve the functionality of the managed lane concept and/or save costs. These suggested changes would then be evaluated by GDOT to determine if they should be implemented into the project.

## **RESULTS OF THE STUDY**

Bridges, retaining walls and paving constitute 68% of the project's cost and thus the VE team focused its efforts on these aspects of the project. This yielded 19 alternatives with cost saving opportunities and 2 design suggestions that will either save non-quantified costs or enhance the functionality of the project. The following highlights those alternatives that will have the greatest impact on the project.

Placing the I-75 managed lanes on the west side of I-75 from the I-285 interchange to the I-575 interchange requires a substantial portion of the roadway to be placed on bridges to span over roadways, wetland areas and adjacent railroad tracks. Starting between Gresham Road and North Marietta Parkway there is a substantial amount of open GDOT right-of-way on the east side of I-75. To take advantage of this, Alt. No. G-4 suggests that the managed lanes cross I-75 at this location to proceed north on the east side of I-75. On this side of I-75 there are no wetlands or railroads allowing longer stretches of roadway to be placed on-grade or on embankment supported by MSE walls on one side or two sides, which greatly reduces the cost of the roadway. The connection to the one-lane sections on I-75 and I-575 north of the interchange are also simplified. Building on the east side of I-75 at the interchange is also much easier than building in the median.

Alt. No. B-6 eliminates Bridge No. 4 over Windy Ridge Parkway by bringing it down to grade and adjusting the profiles of Bridge Nos. 2A, 2B, 2C, 7 and 13. In addition to eliminating the bridge, portions of the other bridges are placed on embankments formed using MSE walls which further reduces bridge construction costs substantially as well as long term maintenance costs.

The current design has the I-75 managed lanes bridging over Gresham Road. The Gresham Road Bridge over I-75 can be extended and the managed lanes run under the extended bridge to eliminate part of Bridge No. 19. Although this may require detouring traffic on Gresham Road around the construction area, large cost savings can be achieved as illustrated in Alt. No. B-2.

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Two opportunities for pavement reduction are provided in Alt. Nos. P-1 and P-3. In the former, an 11-ft.-wide lane is used adjacent to the 10-ft.-wide shoulder to narrow the managed lane cross section where two managed lanes are provided on I-75. Since no trucks will be allowed in the managed lanes, this should not present a safety problem and the wide shoulder provides ample maneuvering room. In the latter, soil cement is substituted for the asphalt base under the concrete pavement to provide the desired separation at a significant reduction in cost.

## **EVALUATION OF ALTERNATIVES AND DESIGN SUGGESTIONS**

When reviewing the study results, each part of an alternative or design suggestion should be considered on its own merit. There may be a tendency to disregard an alternative because of a concern about one part of it. Each area within an alternative or design suggestion that is acceptable should be considered for use in the final design, even if the entire alternative or design suggestion is not implemented. Variations of these alternatives and design suggestions by GDOT are encouraged.

All alternatives and design suggestions were developed independently of each other to provide a broad range of options to consider for implementation. Therefore, some are mutually exclusive, so acceptance of one may preclude the acceptance of another. In addition, some of the alternatives may be interrelated, so acceptance of one or more may not yield the total of the cost savings shown for each alternative. Design suggestions could also be interrelated, thus precluding a part of one or more suggestions from being implemented if another design suggestion is also implemented.

All alternatives should be carefully reviewed in order to select the combination of ideas with the greatest beneficial impact on the project. Once this has been accomplished, the total cost savings resulting from the VE study can be calculated based on implementing a revised, all-inclusive design solution.



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-2**

DESCRIPTION: **TAKE THE MANAGED LANES UNDER GRESHAM ROAD AND ELIMINATE PART OF BRIDGE NO. 19**

SHEET NO.: **1 of 10**

**ORIGINAL DESIGN:** (sketch attached)

The managed lanes go over SR 120 (Roswell Road), over Gresham Road and over the southbound ramp from SR 120L (South Marietta Parkway). The alignment is on the bridge for this entire portion.

**ALTERNATIVE:** (sketch attached)

Once the alignment passes over SR 120, bring the roadway down to near the existing ground line elevation, pass it under Gresham Road, and then have it rise to go over the southbound ramp from SR 120L. The bridge will be replaced by an at-grade section or an embankment with mechanically stabilized embankment (MSE) walls on each side from Station 517+10 to 542+25, a length of 2,515 ft. The west span of the Gresham Road bridge will be removed and replaced with a longer span to accommodate the managed lanes.

**ADVANTAGES:**

- Reduces bridge construction
- Reduces bridge maintenance
- Reduces construction time

**DISADVANTAGES:**

- Disrupts traffic on Gresham Road during construction

**DISCUSSION:**

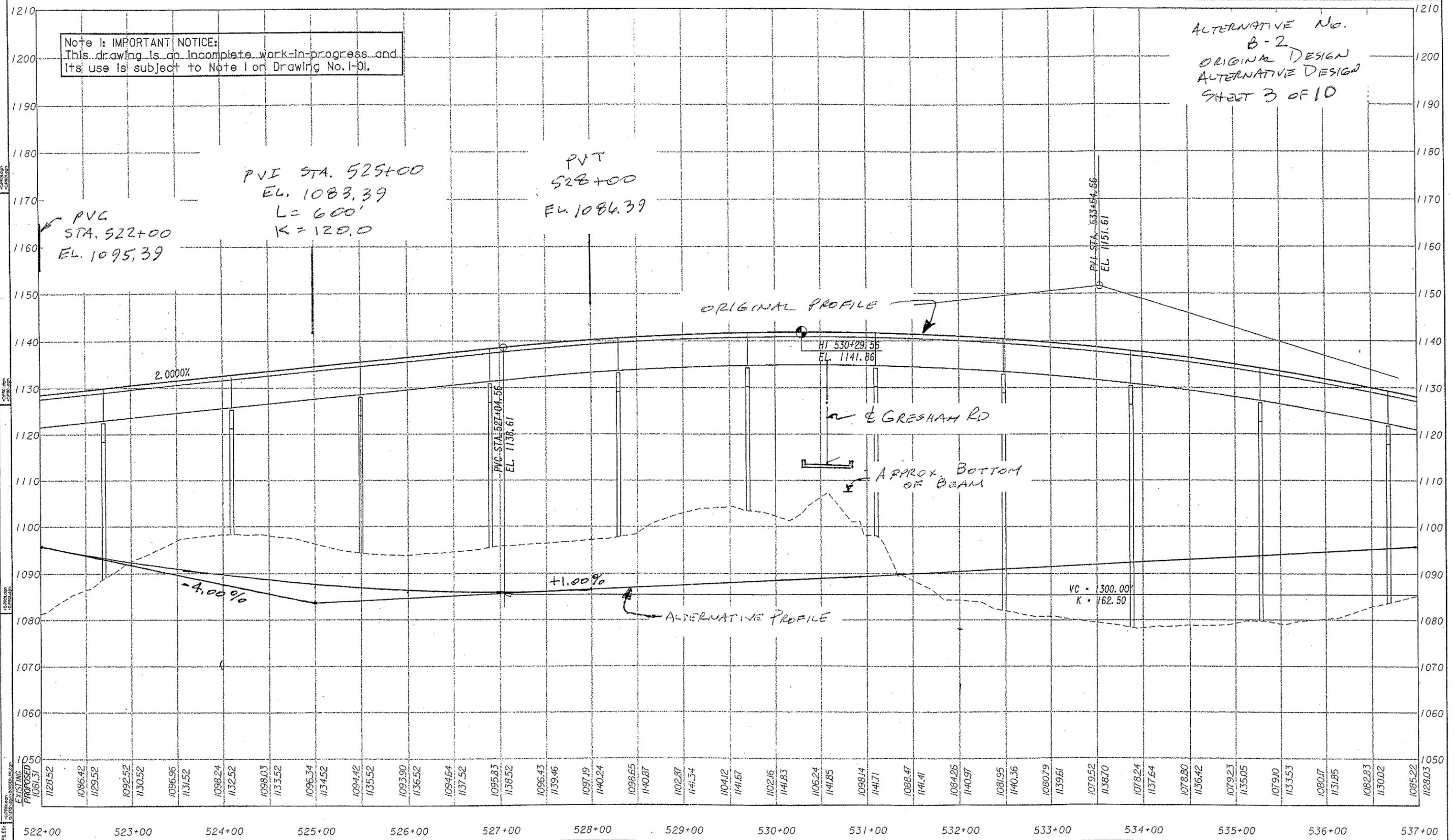
By lowering the grade of the managed lanes and having them go under Gresham Road, approximately 2,515 ft. of bridge can be eliminated and replaced by roadway at grade or MSE wall supported embankment. Portions of this bridge are nearly 60 ft. high, making the bridge very expensive. The western end span of the Gresham Road Bridge over I-75 will have to be replaced to accommodate the managed lanes. This can be accomplished either by using staged construction of the bridge or by closing the road. If the road is closed, traffic would be detoured onto Woolco Road, Varner Road, SR 120 (Roswell Road), and Chert Road, a detour length of approximately 0.8 miles.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 29,054,000	—	\$ 29,054,000
ALTERNATIVE	\$ 11,819,000	—	\$ 11,819,000
SAVINGS (Original minus Alternative)	\$ 17,235,000	—	\$ 17,235,000



Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

ALTERNATIVE No.  
B-2  
ORIGINAL DESIGN  
ALTERNATIVE DESIGN  
SHEET 3 OF 10



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11/24/2009

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NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	8/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	PCT	MRM	RHM
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA



1-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

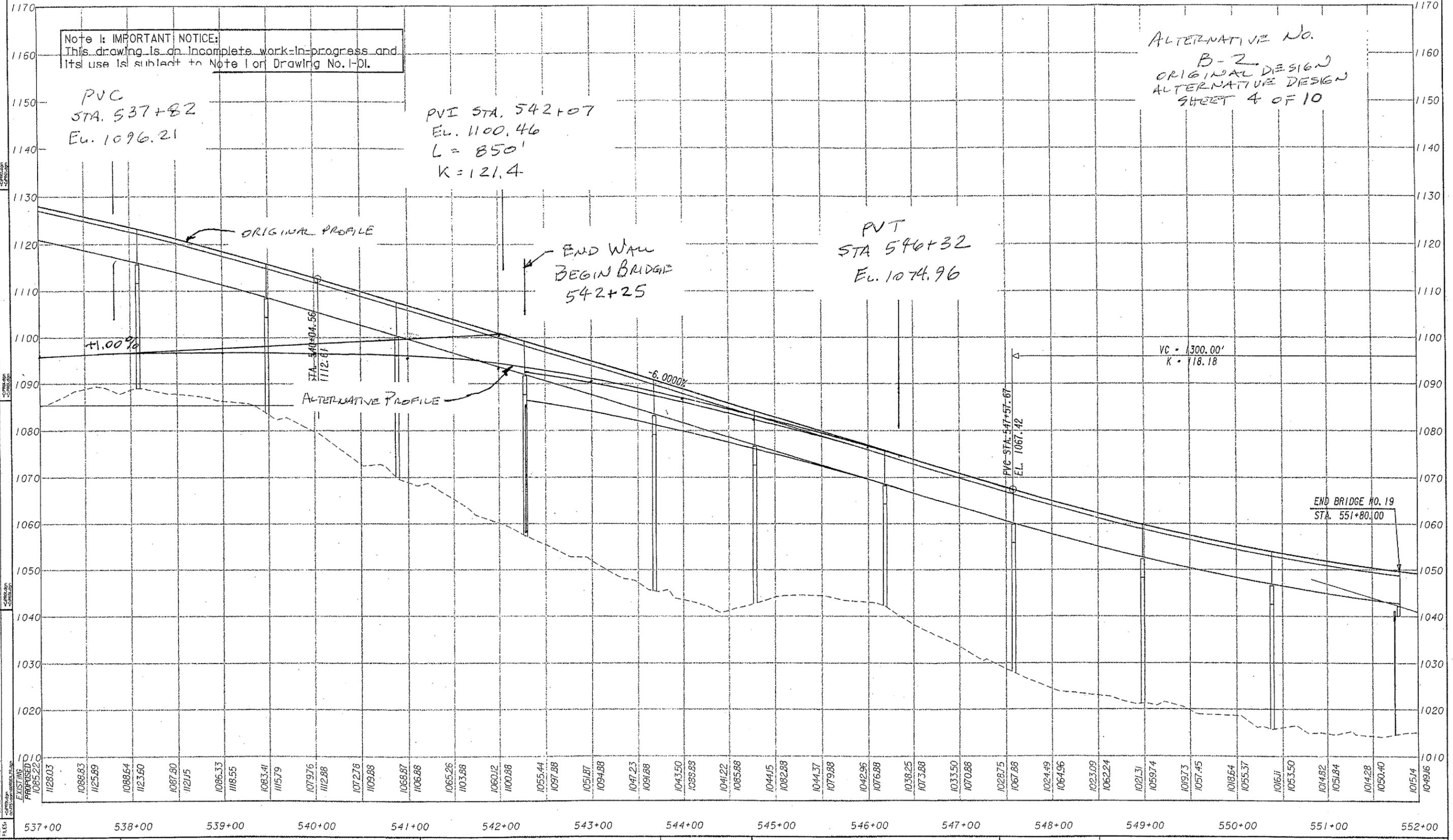
1-75 REVERSIBLE

SCALE: 1" = 50' HORIZ.

DRAWING No.

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.

ALTERNATIVE No.  
B-2  
ORIGINAL DESIGN  
ALTERNATIVE DESIGN  
SHEET 4 OF 10



24-NOV-2009 17:44

11/24/2009

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1010	1088.83	1088.64	1087.80	1086.33	1083.41	1079.76	1072.78	1069.87	1065.26	1060.12	1055.44	1051.87	1047.23	1043.50	1038.25	1033.50	1028.75	1024.49	1019.73	1018.64	1016.11	1015.30	1014.82	1014.28	1010	
537+00	538+00	539+00	540+00	541+00	542+00	543+00	544+00	545+00	546+00	547+00	548+00	549+00	550+00	551+00	552+00											

REVISIONS		NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
CLARA CASH	DATE	A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
CHECKED BY	DATE	B	9/25/09	SOX SUBMITTAL	CEC	PCT	MRM	RHM
SUPERVISOR	DATE	C	11/30/09	PLOTTED PER CDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA



SCALE: 1" = 50' HORIZ.  
1" = 10' VERT.

1-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-24 16

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-2**

SHEET NO.: 5 of 10

## Table of Elevations

P/G = Alternative Profile Grade; Grnd = Existing Ground Elev.;  $\Delta$  = P/G - Grnd

Station	P/G	Grnd	$\Delta$
517+10	1111.01	1079.77	31.24
518+00	1109.36	1079.41	29.95
519+00	1106.76	1077.62	29.14
520+00	1103.36	1074.83	28.53
521+00	1099.39	1075.98	23.41
522+00	1095.39	1081.31	14.08
523+00	1091.81	1092.52	-0.71
524+00	1089.06	1098.24	-9.18
525+00	1087.14	1096.34	-9.20
526+00	1086.06	1093.90	-7.84
527+00	1085.81	1095.83	-10.02
528+00	1086.39	1097.19	-10.80
529+00	1087.39	1102.87	-15.48
530+00	1088.39	1102.16	-13.77
531+00	1089.39	1098.14	-8.75
532+00	1090.39	1084.26	6.13
533+00	1091.39	1080.79	10.60
534+00	1092.39	1078.24	14.15
535+00	1093.39	1079.23	14.16
536+00	1094.39	1080.17	14.22
537+00	1095.39	1085.22	10.17
538+00	1096.38	1088.64	7.74
539+00	1096.82	1086.33	10.49
540+00	1096.43	1079.76	16.67
541+00	1095.23	1068.87	26.36
542+00	1093.20	1060.12	33.08
542+25	1092.56	1057.78	34.78

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

ALT. NO.:

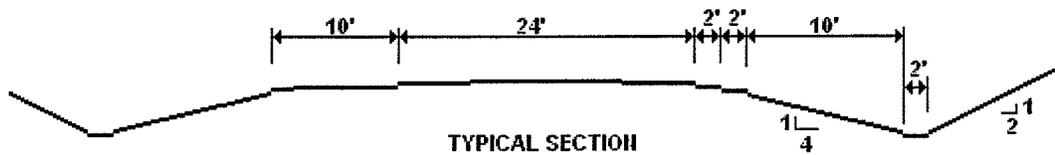
**B-2**

SHEET NO.: 6 of 10

**Original Design:**

Bridge Area = (54225 - 51710)(39.25) = 98,714 SF

**Alternative Design**



This Typical Section applies from Station 522+90 to 531+30.

Earthwork End Area = (Grnd - P/G)(24+10+4) + 2(2)(Grnd - P/G + 2.5) + 2(Grnd - P/G + 2.5)(Grnd - P/G + 2.5)

$\Delta = \text{Grnd} - \text{P/G}$

End Area =  $38\Delta + 4(\Delta + 2.5) + 2(\Delta + 2.5)(\Delta + 2.5)$

Station	End Area	Volume = 100(End Area)/27
523+00	13	48
524+00	286	1059
525+00	287	1063
526+00	262	970
527+00	298	1104
528+00	306	1133
529+00	303	1122
530+00	314	1163
531+00	279	<u>1033</u>
Total		8695 CY

# CALCULATIONS

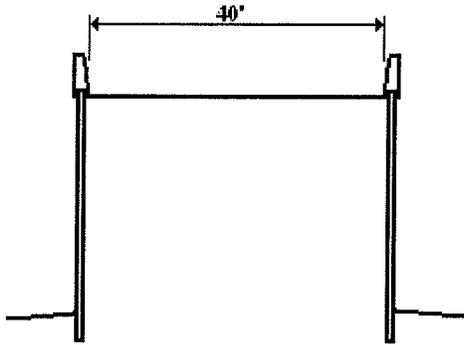


PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

ALT. NO.:

**B-2**

SHEET NO.: 7 of 10



**TYPICAL SECTION**

$$\text{Wall Area} = 2(\text{P/G} - \text{Grnd} + 2.0)L = 2(\Delta + 2.0)L$$

Station	$\Delta$	Wall Area
517+30	31.24	659
518+00	29.95	6390
519+00	29.14	6228
520+00	28.53	6106
521+00	23.41	5082
522+00	14.08	3216
532+00	6.13	1626
533+00	10.60	2520
534+00	14.15	3230
535+00	14.16	3232
536+00	14.22	3244
537+00	10.17	2434
538+00	7.74	1948
539+00	10.49	2498
540+00	16.67	3734
541+00	26.36	5672
542+00	33.08	<u>7016</u>
Total		64,835 SF

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-2**

SHEET NO.: **8 of 10**

$$\text{Additional Pavement} = 36(2515)/9 = 10060 \text{ SY}$$

Pavement Section Unit Cost (\$/SY):

12" Plain Jointed Concrete Pavement:	=	\$112 / SY
3" Asphaltic Concrete: 330#/SY x TN/2000# x \$95/TN	=	\$15.68 / SY
12" G.A.B.	=	<u>\$40 / SY</u>
Total	=	\$167.68 / SY

Bridge Area at Gresham Road:

$$\text{Existing to be removed} = 66.42(54.18) = 3600 \text{ SF}$$

$$\text{Span to be constructed} = 80(66.42) = 5314 \text{ SF}$$

$$\text{Wall area} = 91(20) + 20(40) = 2620 \text{ SF}$$

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

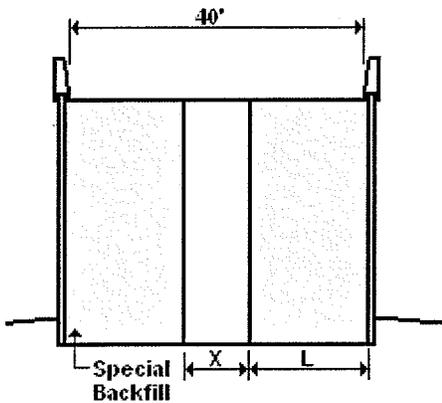
ALT. NO.:

**B-2**

SHEET NO.: **9 of 10**

## Borrow Excavation between MSE wall Special Backfill

Station	$\Delta$	X	Volume
517+10	31.24	0.00	0
518+00	29.95	0.00	0
519+00	29.14	0.00	0
520+00	28.53	0.00	0
521+00	23.41	5.23	453
522+00	14.08	18.00	939
532+00	6.13	18.00	409
533+00	10.60	18.00	707
534+00	14.15	18.00	943
535+00	14.16	18.00	944
536+00	14.22	18.00	948
537+00	10.17	18.00	678
538+00	7.74	18.00	516
539+00	10.49	18.00	699
540+00	16.67	14.67	906
541+00	26.36	1.10	107
542+00	33.08	0.00	0
542+50	36.43	0.00	0
<b>TOTAL</b>			<b>8249</b>



$L = .7H + 1$  or 11', whichever is greater



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**B-3**

DESCRIPTION: **INCREASE THE SPAN LENGTHS FOR BRIDGE NO. 13 AND  
 USE SPLICED PRECAST, PRESTRESSED CONCRETE GIRDERS  
 TO REDUCE THE NUMBER OF INTERMEDIATE BENTS**

SHEET NO.: 1 of 5

**ORIGINAL DESIGN:** (sketch attached)

The original design uses span lengths averaging 133 ft. for Bridge No. 13, which is 3,060 ft. long and crosses over Windy Hill Road. This requires 23 spans, 2 end bents and 22 intermediate bents.

**ALTERNATIVE:**

Use four, four-span continuously spliced precast, prestressed concrete girders for the bridge. Each continuous unit will consist of two, 160 ft. spans and two, 225 ft. spans. This requires a total of 16 spans, 2 end bents and 15 intermediate bents.

**ADVANTAGES:**

- Reduces amount of substructure construction
- Reduces the number of girder pieces to handle
- Reduces construction time; fewer bents to construct

**DISADVANTAGES:**

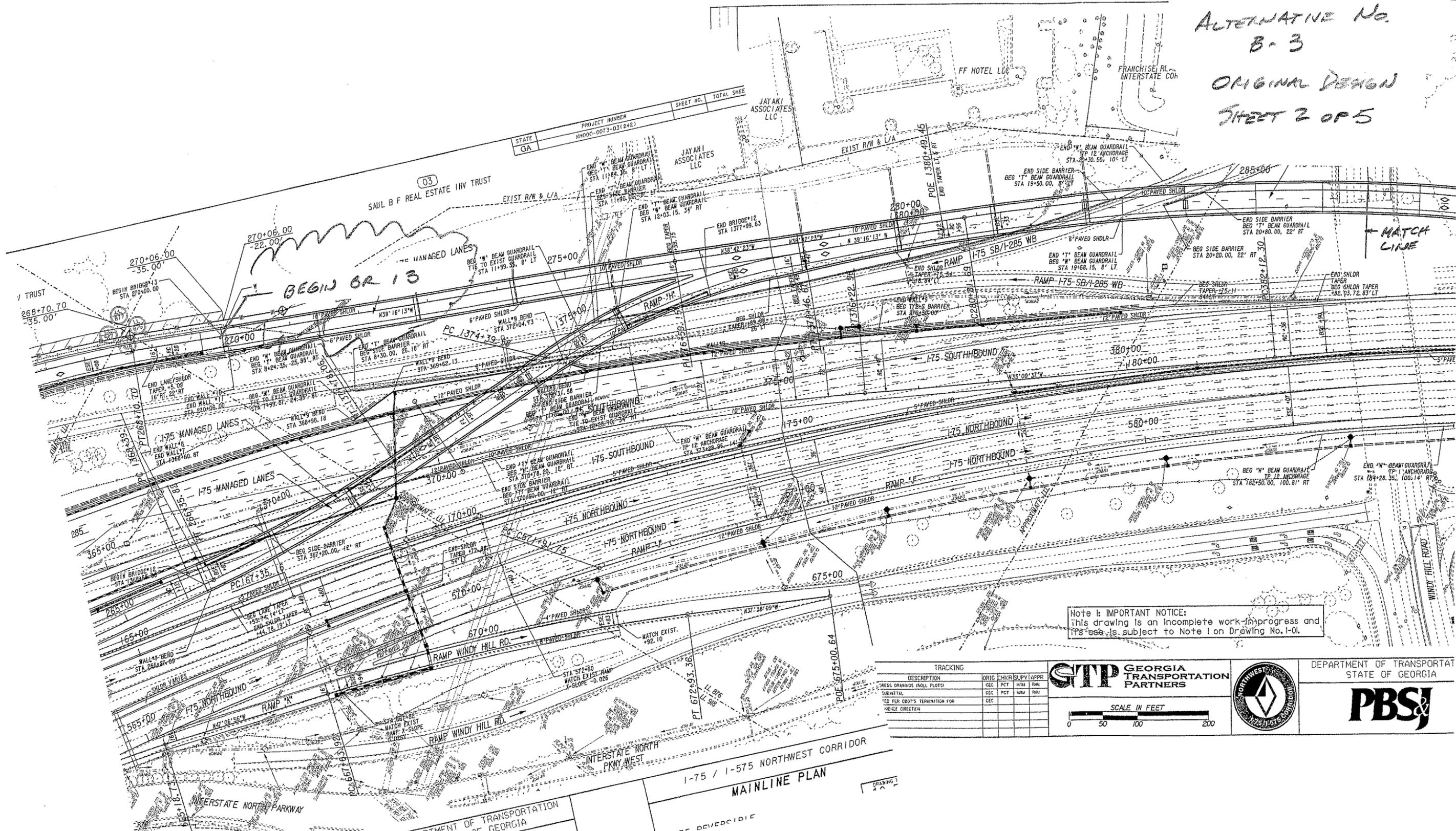
- Increases complexity of superstructure construction

**DISCUSSION:**

The use of spliced, precast, prestressed concrete (PSC) girders has become increasingly common in recent years. Spans within the range of those proposed here are not uncommon. The intermediate bents on this bridge have an average height of over 50 feet. The cap and column will have the same dimensions in the alternative design as in the original design. The footings and number of piles will be increased in the calculations to compensate for the longer spans, however the overall cost will be reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 50,964,000	—	\$ 50,964,000
ALTERNATIVE	\$ 48,291,000	—	\$ 48,291,000
SAVINGS (Original minus Alternative)	\$ 2,673,000	—	\$ 2,673,000

ALTERNATIVE No.  
B-3  
ORIGINAL DESIGN  
SHEET 2 OF 5



STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-021(242)		

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

DESCRIPTION	ORIG	CHK'D	SUPV	APPR
DRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MJM	RAV
SUBMITTAL	CEC	PCT	MJM	RAV
TERM PER CDD'S TERMINATION FOR REVERSE DIRECTION	CEC			

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

**PBS&J**

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

**GTP** GEORGIA TRANSPORTATION PARTNERS

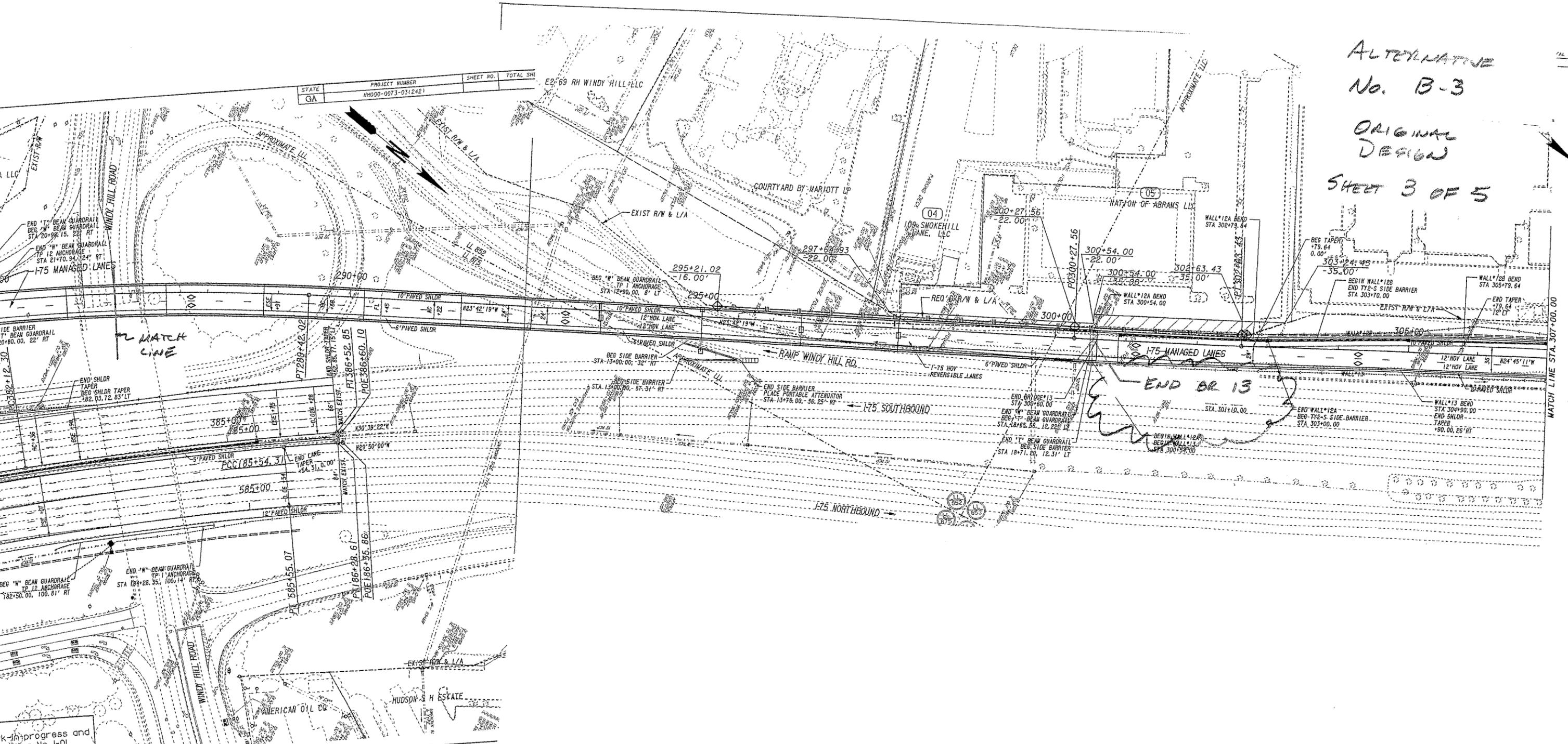
SCALE IN FEET

**PBS&J**

I-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PLAN  
I-75 DEVELOCIDIC

ALTERNATIVE  
No. B-3  
ORIGINAL  
DESIGN  
SHEET 3 OF 5

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	HH000-0073-0312421		



Work in progress and drawing No. I-01.

	DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA	1-75 / I-575 NORTHWE
	<b>PBS&amp;I</b>	MAINLINE I
		1-75 REVERSIBLE

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-3**

SHEET NO.: 4 of 5

## Original Design:

22 Intermediate bents

Columns 12' X 6' X 45' average height

Caps 43'-3" X 6' X 6' average depth

Average footing 21'-6" X 21'-6" X 5'-6" average depth with an average of 18 piles 45 feet long

Concrete:  $22[12(6)(45) + 43.25(6)(6) + 21.5(21.5)(5.5)]/27 = 5980$  CY

Reinf. Steel @ 130#/cy = 778,000 lb

Excavation  $22(24.5)(24.5)(8)/27 = 3915$  CY

Piling (14HP89)  $22(18)(45) = 17,800$  LF

## Alternative Design:

15 Intermediate bents

Columns 12' X 6' X 45' average height

Caps 43'-3" X 6' X 6' average depth

Average footing 23'-0" X 23'-0" X 5'-6" depth with an average of 22 piles 45 feet long

Concrete:  $15[12(6)(45) + 43.25(6)(6) + 23(23)(5.5)]/27 = 4281$  CY

Reinf. Steel @ 130#/cy = 556,500 lb

Excavation  $15(26)(26)(8)/27 = 3000$  CY

Piling (14HP89)  $15(22)(45) = 14,850$  LF

## Superstructure:

Superstructure Area =  $3060(43.25) = 132,345$  SF for original and alternative

Costs:

Class AA concrete: \$2300/CY

Superstr Reinf: \$2.64/LB

Excavation: \$103.50/CY

Piling (14HP89): \$258.50/LF

Superstructure: Original \$283/SF; Deduct 25% for Substructure: \$213/SF

Use 10% higher unit cost for superstructure since girders must be post-tensioned. Slab is the Same. The cost of the girders is approximately one-half of the superstructure cost.

Alternative:  $1.10(213) = 234$ /SF



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-5**

DESCRIPTION: **STRAIGHTEN THE MANAGED LANES ALIGNMENT AT SOUTH MARIETTA PARKWAY AND PLACE THEM AT-GRADE TO GO UNDER THE SOUTH MARIETTA PARKWAY BRIDGE; USE BRAIDED RAMP BRIDGES**

SHEET NO.: **1 of 4**

**ORIGINAL DESIGN:** (sketch attached)

Bridge No. 17 runs parallel to the west side of the I-75 exit and entrance ramps and over South Marietta Parkway. The bridge transitions to mechanically stabilized embankment (MSE) on both sides of the roadway.

**ALTERNATIVE:** (sketch attached)

Realign Bridge No. 17 to braid over the entrance ramp and return to grade in order to run under the South Marietta Parkway Bridge end span. Continue the lanes over a braid bridge for the exit ramp and then back to existing grade.

**ADVANTAGES:**

- Shortens the bridge length
- Reduces construction material and labor requirements
- Decreases maintenance of traffic (MOT) for South Marietta Parkway
- Decreases bridge maintenance

**DISADVANTAGES:**

- Increases MOT for the ramps
- Need for ramp detours

**DISCUSSION:**

The current alignment consists of a bridge which runs around the ramps and over busy South Marietta Parkway. The alternative reduces the impact on the parkway by going under it, except on the ramps. The existing profile grade for I-75 is approximately 4% to the south, therefore the Managed Lanes profile is better suited to go over the entrance ramp, under South Marietta Parkway and under the exit ramp. The proposed alignment is similar to that at the North Marietta Parkway.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 30,217,000	—	\$ 30,217,000
ALTERNATIVE	\$ 23,538,000	—	\$ 23,538,000
SAVINGS (Original minus Alternative)	\$ 6,679,000	—	\$ 6,679,000





# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130*  
*Cobb County, GA*

ALT. NO.:

**B-5**

SHEET NO.: **3 of 4**

Existing bridge reduction:

Length: Sta 469+35 – 454+45 = 1,490 ft.

Width: 39.25'

Area: **58,483 SF**

Existing wall reduction:

Length: Sta 2(478+20 – 469+35) + 39 = 1,809 ft.

Ave. Height: (20'+25')/2= 22.5 ft.

MSE Area: **40,703 SF**

Proposed bridge:

Entrance Braid: 44'x200' = 8,800 SF

Exit Braid: 44'x450' = 19,800 SF      **SUM= 28,600 SF**

Proposed walls:

MSE:

Entrance ramp: 610'x(3'+22'/2)= 7,625 SF

200'x22' = 4,400 SF

25'x22' = 550 SF

820'x12.5' = 10,250 SF

Exit ramp: 380'x12.5' = 4,750 SF

225'x22' = 4,950 SF

500'x12.5' = 6,250 SF      **SUM: 38,775 SF**

Tie-back:

Exit ramp: 250'x22' =

(500'+380'+500')x12.5= 17,250 SF

(225'+450')x22' = 14,850 SF      **SUM: 32,100 SF**

Roadway Pavement:

Length: 478+80 – 455+37 = 2,343 ft.

Width: 36 ft.

Area: 2343'x36'/9= **9,372 SY**

Calculations for the mainline Pavement Section Unit Cost (\$/SY):

12" Plain Jointed Concrete Pavement: = \$112 / SY

3" Asphaltic Concrete: 330#/SY x TN/2000# x \$95/TN = \$15.68 / SY

12" G.A.B. = \$40 / SY

Total = **\$167.68 / SY**



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-6**

DESCRIPTION: **RUN THE HAVE MANAGED LANES UNDER WINDY RIDGE**  
**PARKWAY AND DELETE BRIDGE NO. 4**

SHEET NO.: **1 of 11**

**ORIGINAL DESIGN:** (sketch attached)

Bridge Nos. 2A and 7 merge into Bridge No. 4 (Ramp Z) and fly over Windy Ridge Parkway. Bridge No. 4 stays elevated until Wall No. 10 and eventually Bridge No. 13. The high alignment occurs due to the clearance Bridge No. 7 requires over the I-75 southbound (SB) to I-285 westbound (WB) ramp.

**ALTERNATIVE:** (sketch attached)

Lower Bridge Nos. 2A and 2B to at-grade before the Bridge No. 4 merge. Maintain the profile at-grade until Bridge No. 13, therefore eliminating Bridge No. 4. Provide a wall at Sta. 235+50 and construct Bridge 2C at the lowered Bridge No. 2 spans 11 and 12. Due to geometric constraints, extend Bridge No. 7 over Windy Ridge Parkway and drop it to grade in order to merge with Ramp Z. Reduce Wall Nos. 10 and 11 to abutment walls for Bridge No. 13.

**ADVANTAGES:**

- Reduces bridge structure
- Reduces material requirements
- Reduces bridge maintenance

**DISADVANTAGES:**

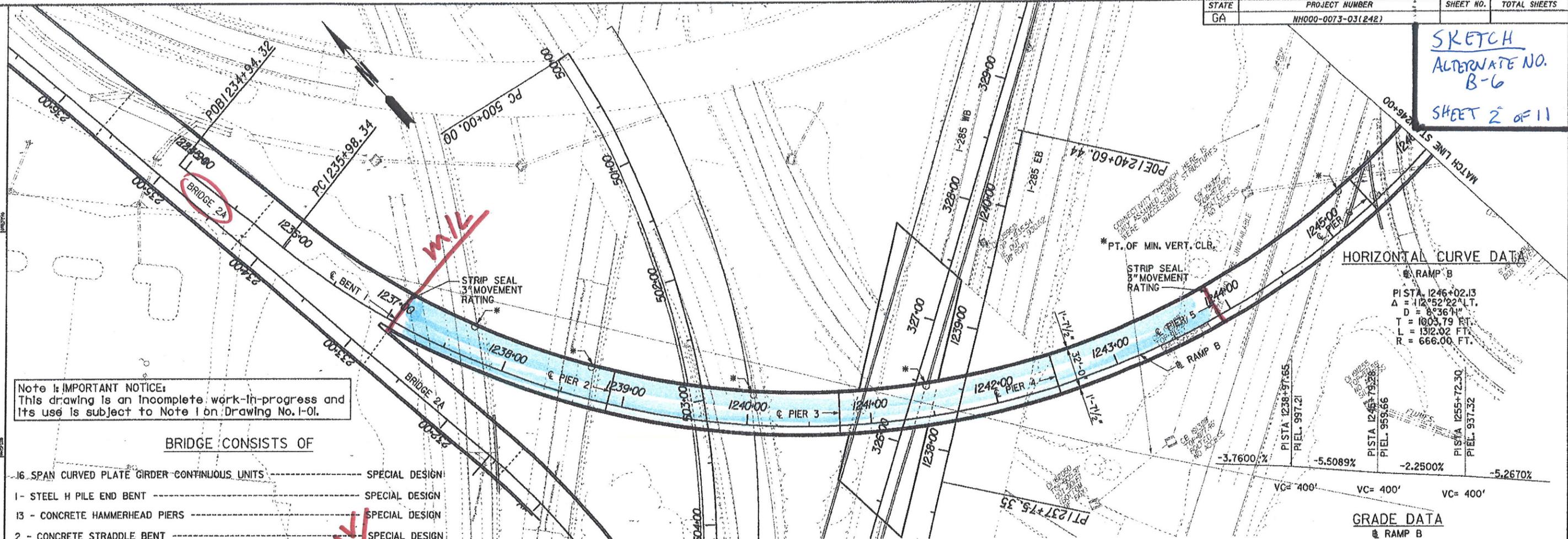
- Slight shift in alignment may require additional right-of-way
- Requires a 6% grade at the north end (downhill direction) of the extended Bridge No. 7 to reduce bridge length

**DISCUSSION:**

Separating Bridge No. 7 from Bridge Nos. 2A and 4 allows the length reduction for Bridge Nos. 2A and 2B as well as eliminating Bridge No. 4. There is still room for the Ramp Z two-to-one lane merge before Bridge No. 7 joins Ramp Z (back to two lanes). The 6% down grade for the new end of Bridge No. 7 allows for the reduction of the extension.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 60,368,000	—	\$ 60,368,000
ALTERNATIVE	\$ 25,085,000	—	\$ 25,085,000
SAVINGS (Original minus Alternative)	\$ 35,283,000	—	\$ 35,283,000

SKETCH  
ALTERNATE NO.  
B-6  
SHEET 2 OF 11



Note: IMPORTANT NOTICE:  
This drawing is an Incomplete work-in-progress and  
Its use is subject to Note 1 on Drawing No. I-01.

BRIDGE CONSISTS OF

- 16 SPAN CURVED PLATE GIRDER CONTINUOUS UNITS ----- SPECIAL DESIGN
- 1 STEEL H PILE END BENT ----- SPECIAL DESIGN
- 13 CONCRETE HAMMERHEAD PIERS ----- SPECIAL DESIGN
- 2 CONCRETE STRADDLE BENT ----- SPECIAL DESIGN
- 1 CONCRETE SHARED MULTI-COLUMN BENT ----- SPECIAL DESIGN

CURVED PLATE GIRDER CONTINUOUS UNITS  
180'-0", 187'-0", 175'-0", 140'-0"  
150'-0", 180'-0", 180'-0", 205'-0", 180'-0"  
160'-0", 185'-0", 200'-0", 108'-0"  
211'-0", 213'-0", 208'-9/4"

PLAN  
TOTAL LENGTH OF BRIDGE = 2862'-9/4"

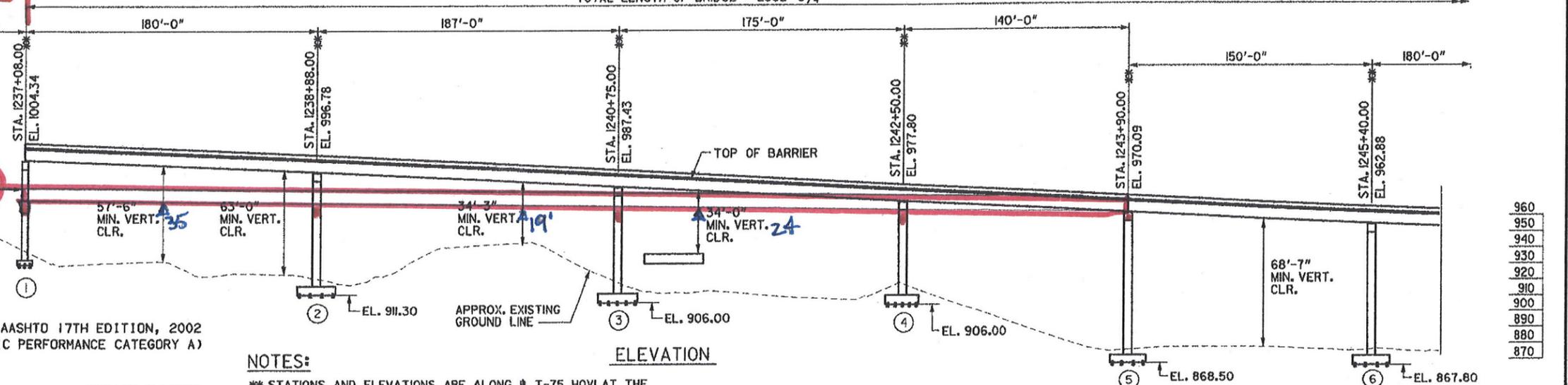
1010
1000
990
980
970
960
950
940
930
920

DESIGN DATA

SPECIFICATIONS ----- AASHTO 17TH EDITION, 2002  
(DESIGNED FOR SEISMIC PERFORMANCE CATEGORY A)

TYPICAL HS20-44 AND/OR MILITARY LOADING ----- IMPACT ALLOWED

FUTURE PAVING ALLOWANCE ----- 30 LBS PER SQ FT



ELEVATION

NOTES:

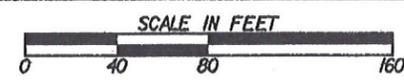
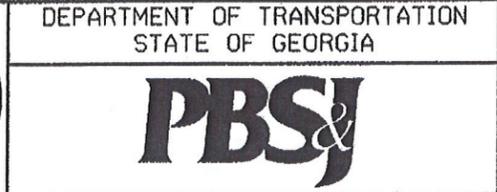
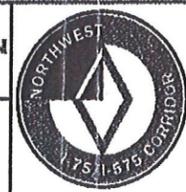
\*\* STATIONS AND ELEVATIONS ARE ALONG I-75 HOVI AT THE INTERSECTION OF I-75 HOVI WITH B.F.P.R. OR PIER.

END BENT PILES NOT SHOWN.

BENTS / PIERS ARE RADIAL U.N.O.

11/30/2009 9:37:46 AM

REVISIONS	
CAB/DRB	11-18-09
DRAWN BY	DATE
CHECKED BY	DATE
SUPERVISOR	DATE
APPROVED	DATE



BRIDGE SHEET 1 OF 16

COBB COUNTY NH000-0073-03(242)

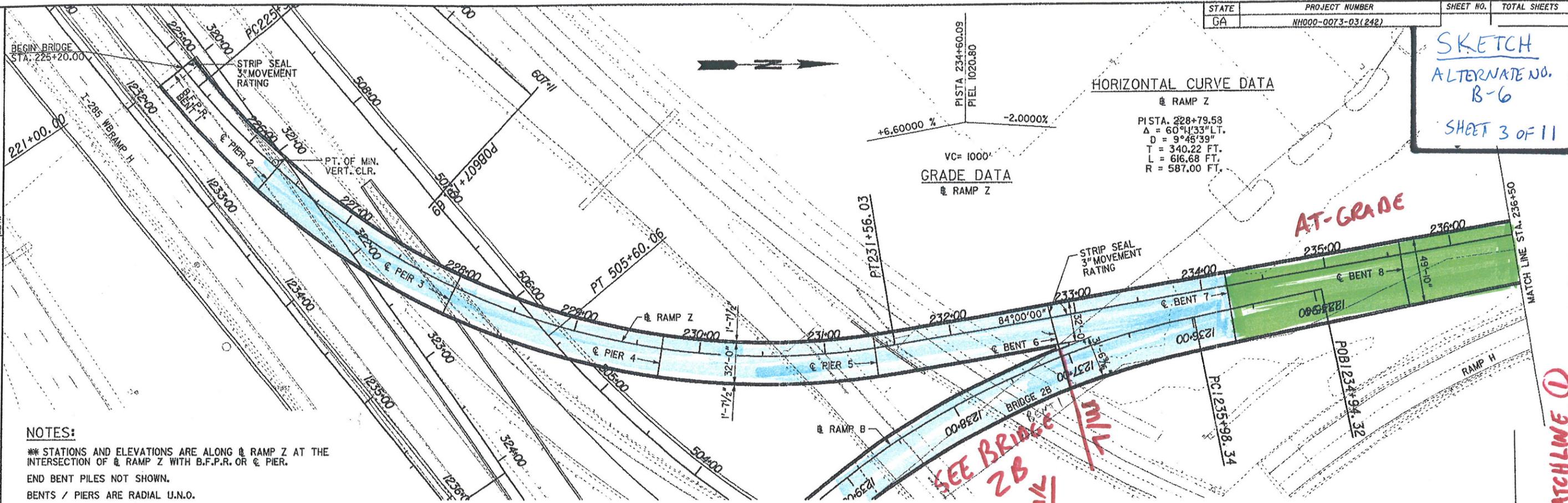
1-75 / I-575 NORTHWEST CORRIDOR

RAMP B TO I-285 EB

STA. 1237+08.00 TO STA. 1265+70.77

DRAWING NO. 35-104

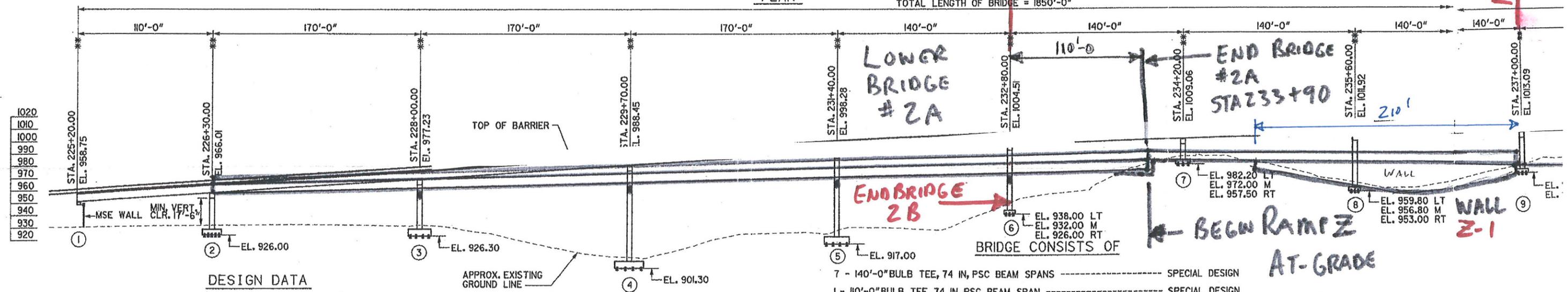
SKETCH  
ALTERNATE NO.  
B-6  
SHEET 3 OF 11



**NOTES:**  
 \* STATIONS AND ELEVATIONS ARE ALONG RAMP Z AT THE INTERSECTION OF RAMP Z WITH B.F.P.R. OR PIER.  
 END BENT PILES NOT SHOWN.  
 BENTS / PIERS ARE RADIAL U.N.O.

PLAN

TOTAL LENGTH OF BRIDGE = 1850'-0"



DESIGN DATA

ELEVATION

SPECIFICATIONS ----- AASHTO 17TH EDITION, 2002  
 (DESIGNED FOR SEISMIC PERFORMANCE CATEGORY A)  
 TYPICAL HS20-44 AND/OR MILITARY LOADING ----- IMPACT ALLOWED  
 FUTURE PAVING ALLOWANCE ----- 30 LBS PER SQ FT

**Note 1: IMPORTANT NOTICE:**  
 This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.

- BRIDGE CONSISTS OF
- 7 - 140'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
  - 1 - 110'-0" BULB TEE, 74 IN, PSC BEAM SPAN ----- SPECIAL DESIGN
  - 1 - 5 SPAN CURVED PLATE GIRDER CONTINUOUS UNIT ----- SPECIAL DESIGN  
 (110'-0", 170'-0", 170'-0", 170'-0", 140'-0")
  - 1 - STEEL H PILE END BENT ----- SPECIAL DESIGN
  - 9 - CONCRETE HAMMERHEAD PIERS ----- SPECIAL DESIGN
  - 2 - CONCRETE MULTI-COLUMN BENTS ----- SPECIAL DESIGN
  - 2 - CONCRETE SHARED INTERMEDIATE BENTS ----- SPECIAL DESIGN

PROJECT P.J. NO. 714130  
 BRIDGE NO. 2A

CAB/DRB		REVISIONS						
DATE	11-18-09	NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
DRAWN BY		A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB
CHECKED BY		B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
SUPERVISOR		C	11-30-09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CAB			
APPROVED								

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&**

BRIDGE SHEET  
1 OF 12

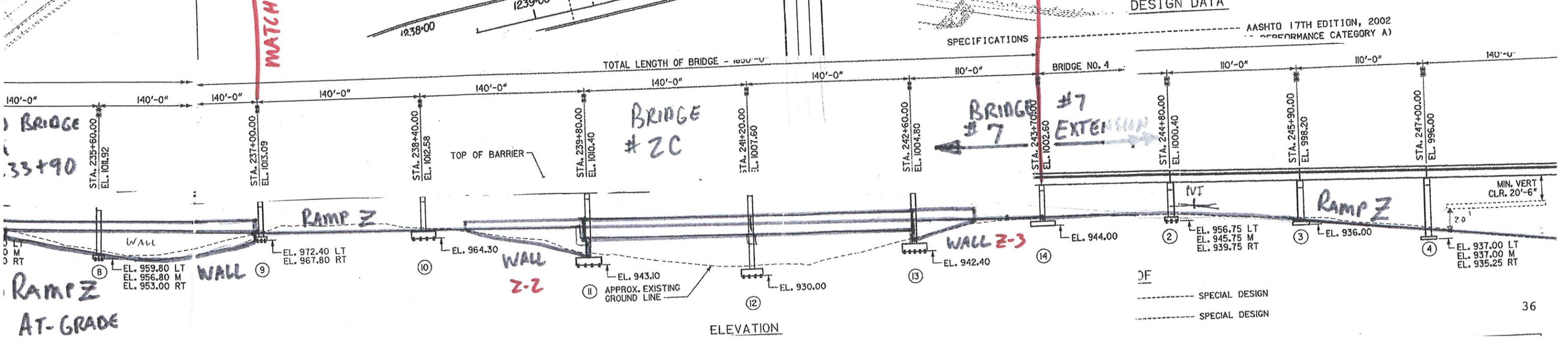
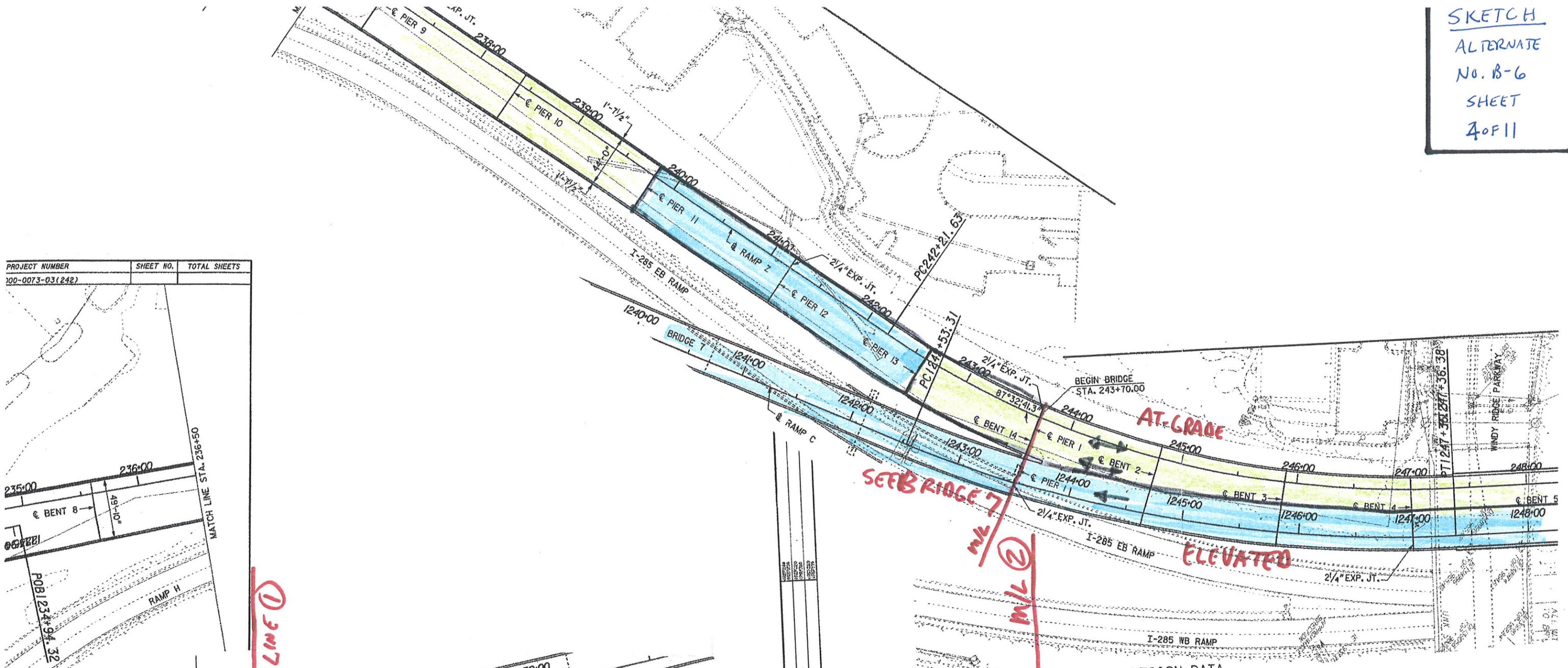
1-75 / 1-575 NORTHWEST CORRIDOR

**RAMP Z OVER 1-285 WB**  
 STA. 225+20 TO STA. 243+70

COBB COUNTY NH000-0073-03(242) DRAWING No. 35-6

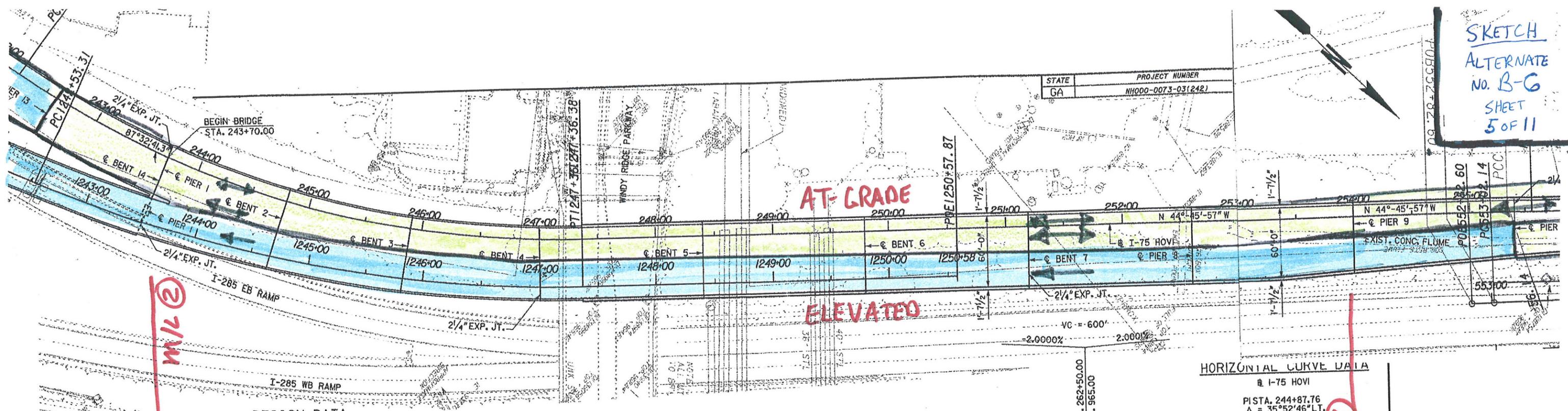
SKETCH  
 ALTERNATE  
 No. B-6  
 SHEET  
 4 OF 11

PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
100-0073-03(242)		



SKETCH  
ALTERNATE  
NO. B-6  
SHEET  
5 OF 11

STATE PROJECT NUMBER  
GA NH000-0073-03(242)



HORIZONTAL CURVE DATA  
# I-75 HOVI

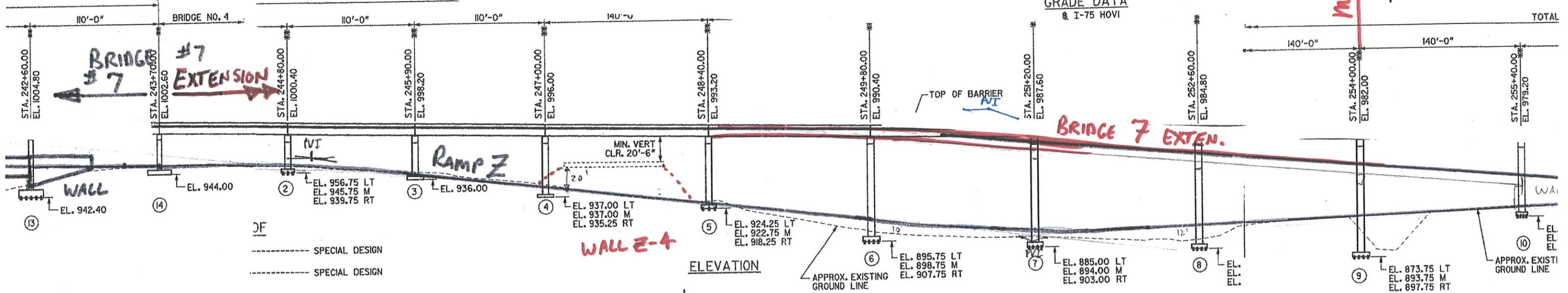
PISTA, 244+87.76
$\Delta = 35^{\circ}52'46''$ LT.
$D = 6^{\circ}58'13''$
$T = 266.13$ FT.
$L = 514.75$ FT.
$R = 822.00$ FT.

DESIGN DATA

PLAN

SPECIFICATIONS AASHTO 17TH EDITION, 2002  
PERFORMANCE CATEGORY A)

GRADE DATA  
# I-75 HOVI



ELEVATION

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

NOTES:

\*\* STATIONS AND ELEVATIONS ARE ALONG # I-75 HOVI AT THE INTERSECTION OF # I-75 HOVI WITH B.F.P.R. OR # PIER.  
END BENT PILES NOT SHOWN.  
BENTS / PIERS ARE RADIAL U.N.O.

PROJECT P.I. NO. 714130

BRIDGE NO. 2A

PROJECT P.I. NO. 7

BRIDGE NO

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

1-75 / 1-575 NORTHWEST CORRIDOR

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

1-75 / 1-575 NORTH

RAMP Z OVER I-285 WB  
STA. 225+20 TO STA. 243+70

1-75 REV. OVER W/ I-285  
STA. 243+70 TO

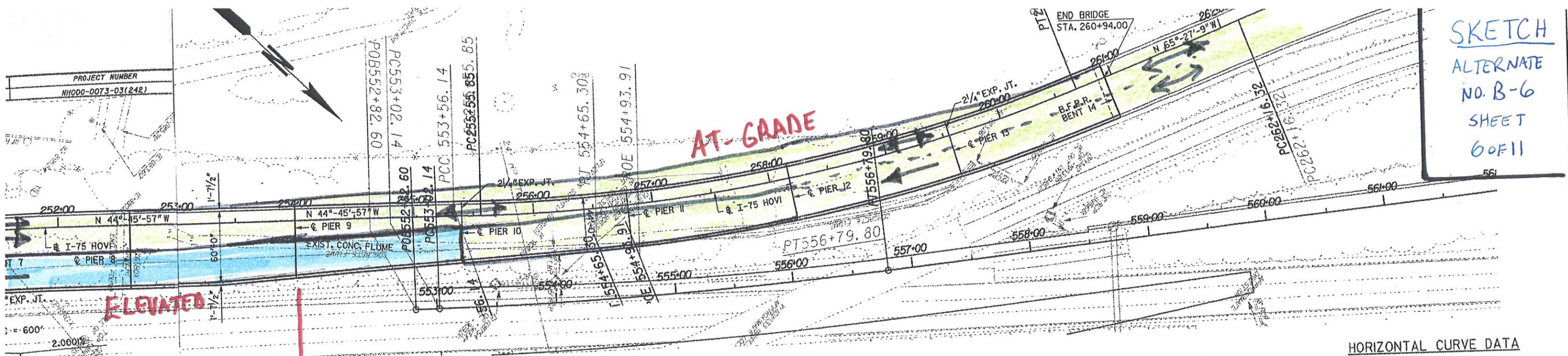
COBB COUNTY NH000-0073-03(242) DRAWING No. 35-7

COBB COUNTY NH000-0073-03(242) BRIDGE SHEET 1 OF 8



REVISIONS		NO	DATE	DESCRIPTION	ORIG	CHKD	SUPV	APP
A	6-30-09			Progress Drawings (RollPlots)	CAB	DRB	BLB	BL
B	9-25-09			50% SUBMISSION	CAB	DRB	BLB	BL
C	11-30-09			PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CAB			

SKETCH  
ALTERNATE  
NO. B-6  
SHEET  
6 OF 11



HORIZONTAL CURVE DATA

☉ I-75 HOVI  
PISTA. 258+5.02  
Δ = 20°41'12" LT.  
D = 4°02'06"  
T = 259.17 FT.  
L = 512.69 FT.  
R = 1420.00 FT.

HORIZONTAL CURVE DATA

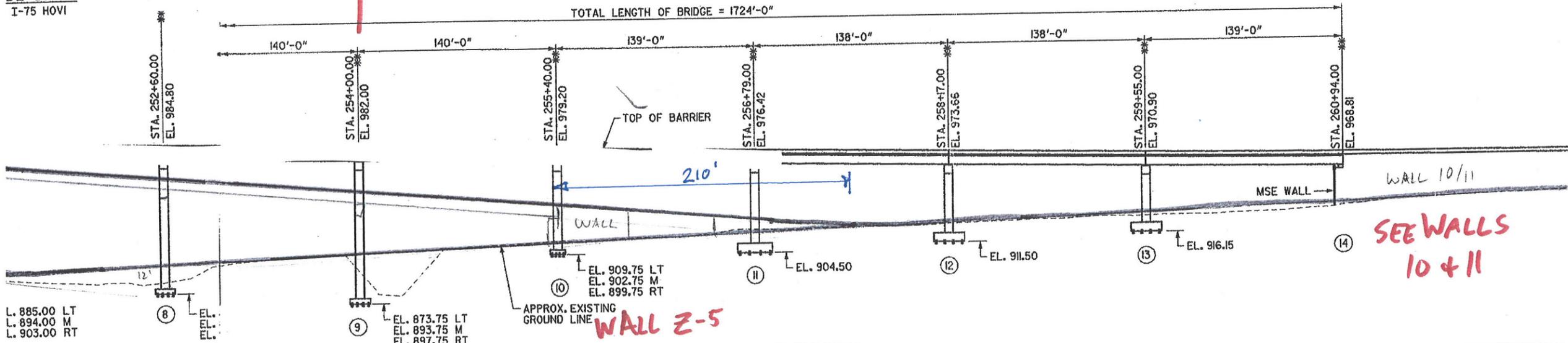
☉ I-75 HOVI  
PISTA. 244+87.76  
Δ = 35°52'46" LT.  
D = 6°58'13"  
T = 266.13 FT.  
L = 514.75 FT.  
R = 822.00 FT.

M/L (3)

PLAN

TOTAL LENGTH OF BRIDGE = 1724'-0"

DE DATA  
I-75 HOVI



990
980
970
960
950
940
930
920
910

SEE WALLS  
10 & 11

WALL 2-5

ELEVATION

Note: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. I-01.

PROJECT P.I. NO. 7

PROJECT P.I. NO. 714130

BRIDGE NO.

BRIDGE NO. 4

I-75 / I-575 NORTH

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER WINDY RIDGE PKWY  
STA. 243+70 TO STA. 260+94

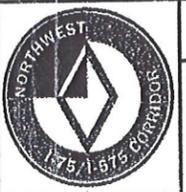
I-75 REV. OVER WINDY RIDGE PKWY  
STA. 243+70 TO STA. 260+94

COBB COUNTY NH000-00

COBB COUNTY NH000-0073-03(242)

DRAWING No.  
35-35

REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6-30-09	Progress Drawings (RollPlots)	CAB	DRB	BLB	BLB
B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
C	11-30-09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CAB			



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

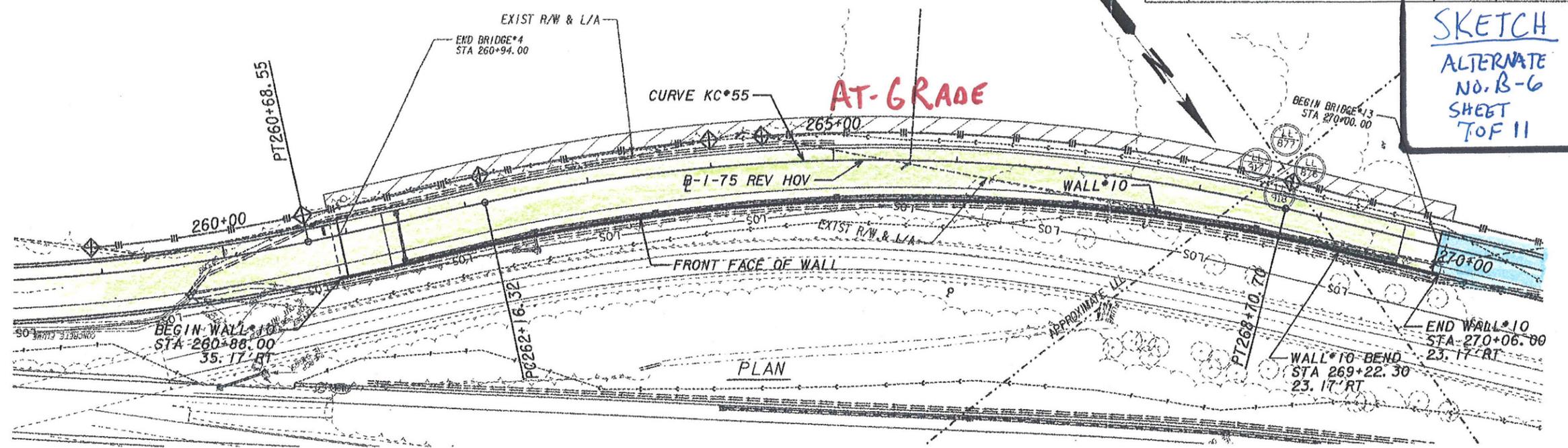


BRIDGE SHEET  
2 OF 8

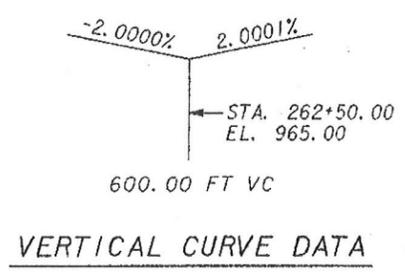
SKETCH  
ALTERNATE  
NO. B-6  
SHEET  
TOP 11

**CURVE KC 55  
1-75 HOV1**

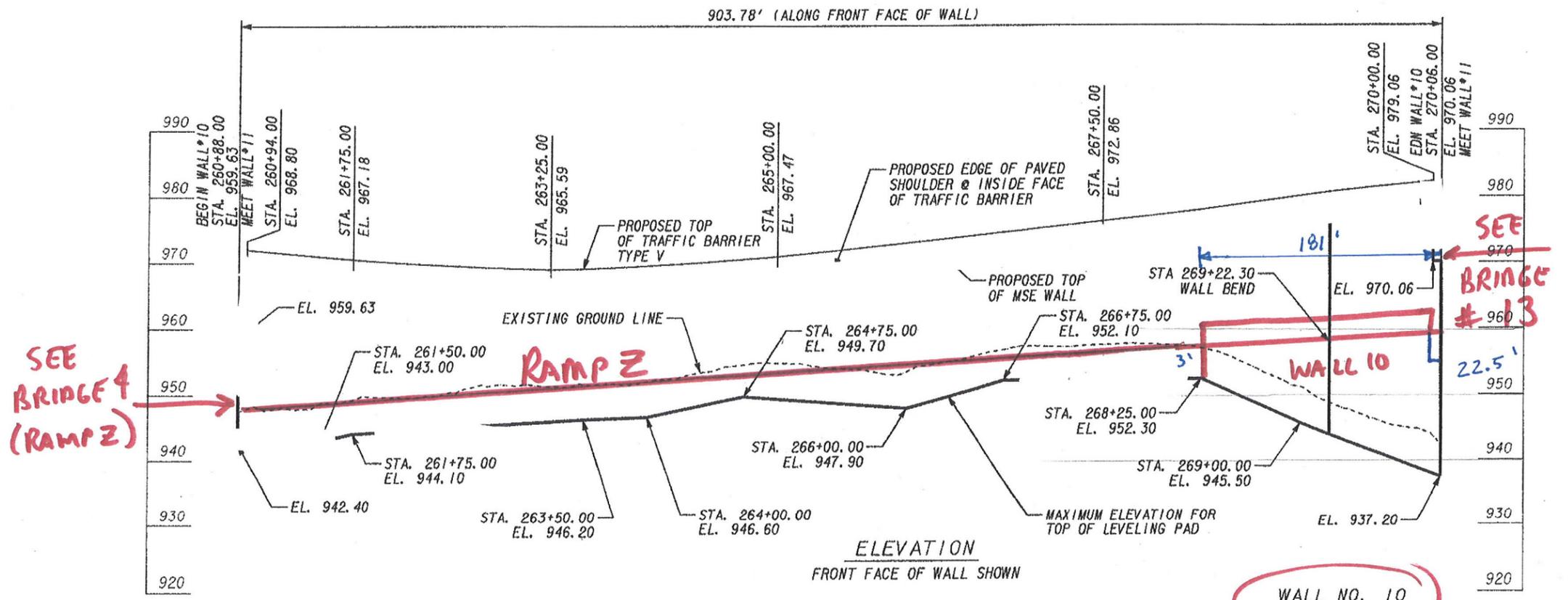
PI STA. 265+49.32  
N= 1417649.4752  
E= 2204612.0973  
Δ= 26°10'56" RT  
DEG= 4°00'04"  
R= 1432.00'  
T= 333.00'  
L= 654.37'  
E= 38.21'  
S.E. = 5.6%  
V= 45 MPH



Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.



- NOTES**
1. STATION SHOWN ARE ALONG CONSTRUCTION B OF 1-75 REV HOV. OFFSETS ARE GIVEN TO FRONT FACE OF WALL.
  2. ELEVATIONS SHOWN ARE AT TOP OF LEVELING PAD OR TOP OF WALL.
  3. VERTICAL DISTANCE BETWEEN TOP OF MSE WALL AND EDGE OF PROPOSED SHOULDER WILL VARY PER 'TRAFFIC BARRIER AND COPING DETAILS'.
  4. SEE ROADWAY PLANS FOR SUPERELEVATION TRANSITION RATES, LOCATION OF BARRIER CONNECTIONS, AND PROPOSED R/W AND EASEMENT STATIONS AND OFFSETS.

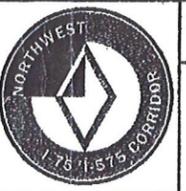


18-NOV-2009 16:05  
11/18/2009  
0A175.dgn 714138N(10).dgn

DRAWN BY		DATE		DESCRIPTION		ORIG		CHKR		SUPV		APPR	
MARK GRIFFIN		1/30/09		PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION		JMG							
CHECKED BY													
SUPERVISOR													
APPROVED													

**GTP GEORGIA TRANSPORTATION PARTNERS**

SCALE IN FEET  
0 50 100 200



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&J**

1-75 / I-575 NORTHWEST CORRIDOR

**RETAINING WALL ENVELOPES**

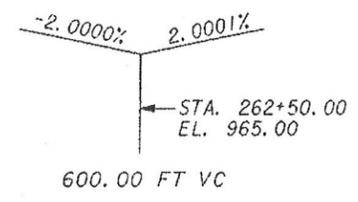
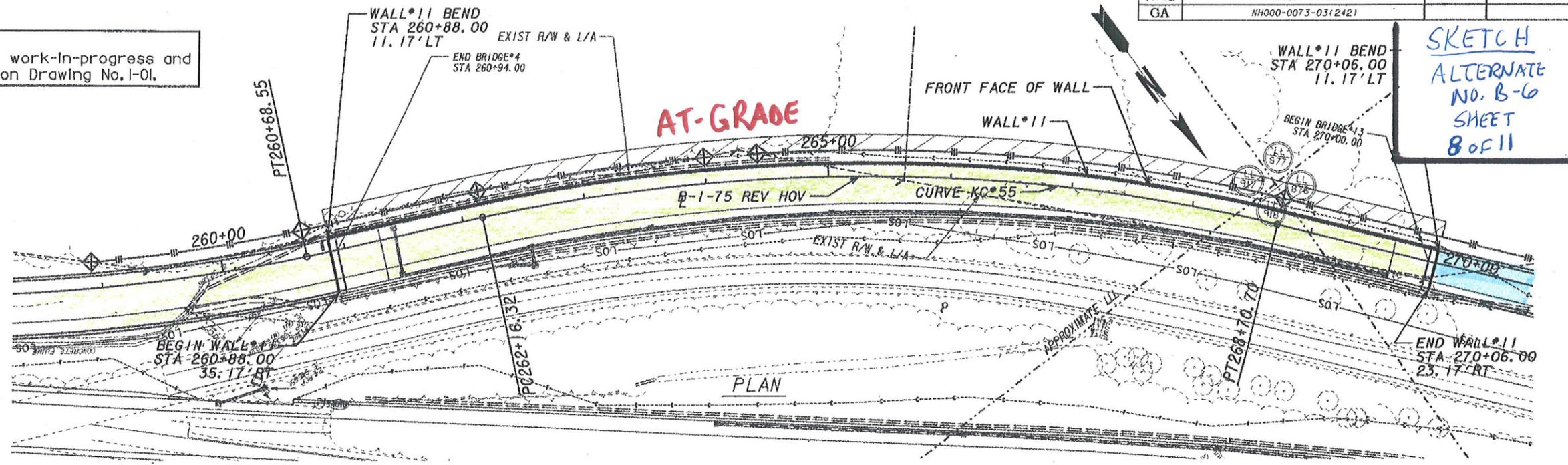
DRAWING NO. 31-11

SKETCH  
ALTERNATE  
NO. B-6  
SHEET  
8 of 11

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. I-01.

CURVE KC 55  
1-75 HOV 1

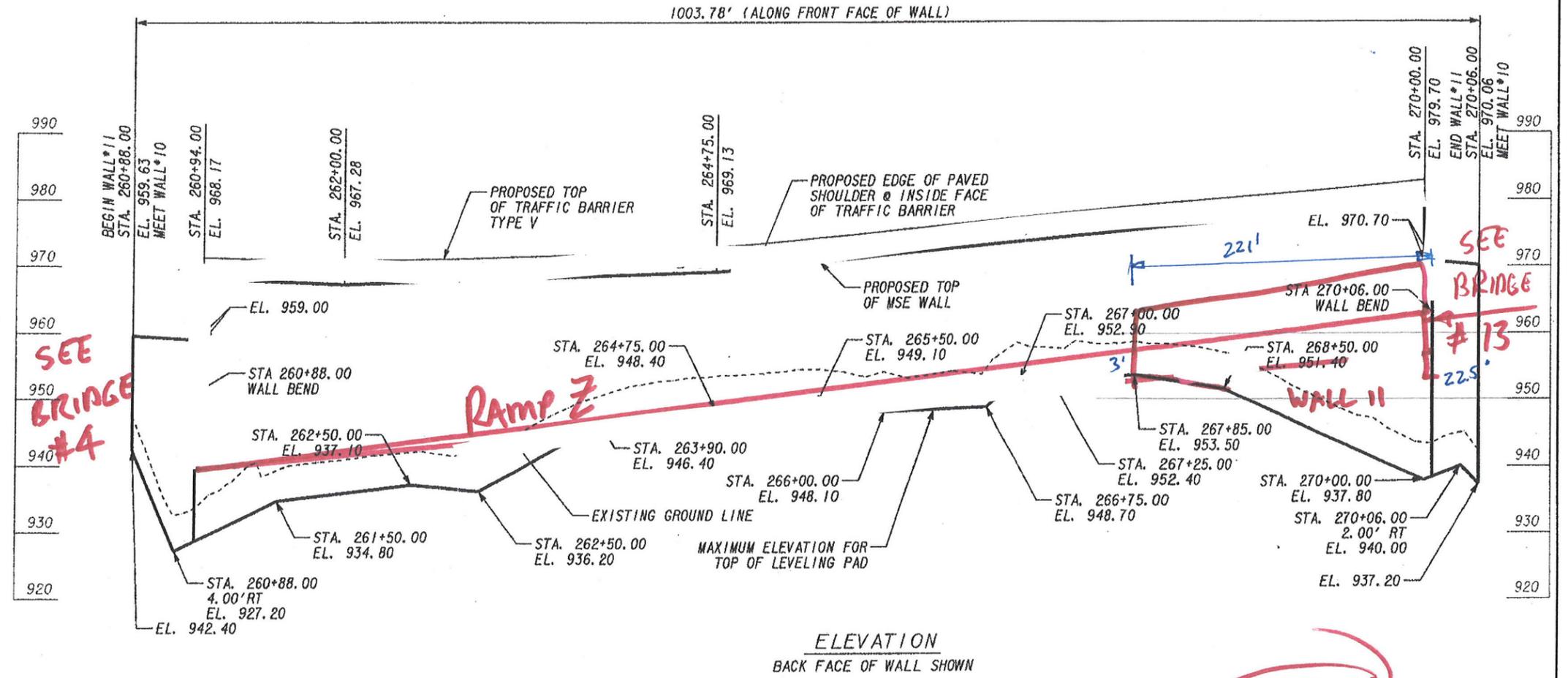
PI STA. 265+49.32  
N= 1417649.4752  
E= 2204612.0973  
Δ= 26°10'56" RT  
DEG= 4°00'04"  
R= 1432.00'  
T= 333.00'  
L= 654.37'  
E= 38.21'  
S.E. = 5.6%  
V= 45 MPH



VERTICAL CURVE DATA

NOTES

1. STATION SHOWN ARE ALONG CONSTRUCTION  $\beta$  OF 1-75 REV HOV. OFFSETS ARE GIVEN TO FRONT FACE OF WALL.
2. ELEVATIONS SHOWN ARE AT TOP OF LEVELING PAD OR TOP OF WALL.
3. VERTICAL DISTANCE BETWEEN TOP OF MSE WALL AND EDGE OF PROPOSED SHOULDER WILL VARY PER "TRAFFIC BARRIER AND COPING DETAILS".
4. SEE ROADWAY PLANS FOR SUPERLEVATION TRANSITION RATES, LOCATION OF BARRIER CONNECTIONS, AND PROPOSED R/W AND EASEMENT STATIONS AND OFFSETS.



ELEVATION  
BACK FACE OF WALL SHOWN

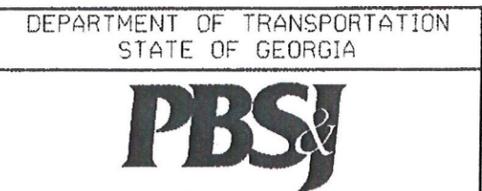
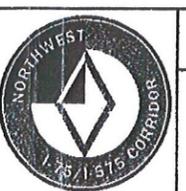
18-NOV-2009 15:05  
 11/18/2009  
 D:\175\175\175\175.dgn  
 MARK GRIFFIN  
 DRAWN BY  
 CHECKED BY  
 SUPERVISOR  
 APPROVED

TRACKING						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
C	11/30/09	PLOTTED PER DOT'S TERMINATION FOR CONVENIENCE DIRECTION	JMG			

**GTP** GEORGIA TRANSPORTATION PARTNERS

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

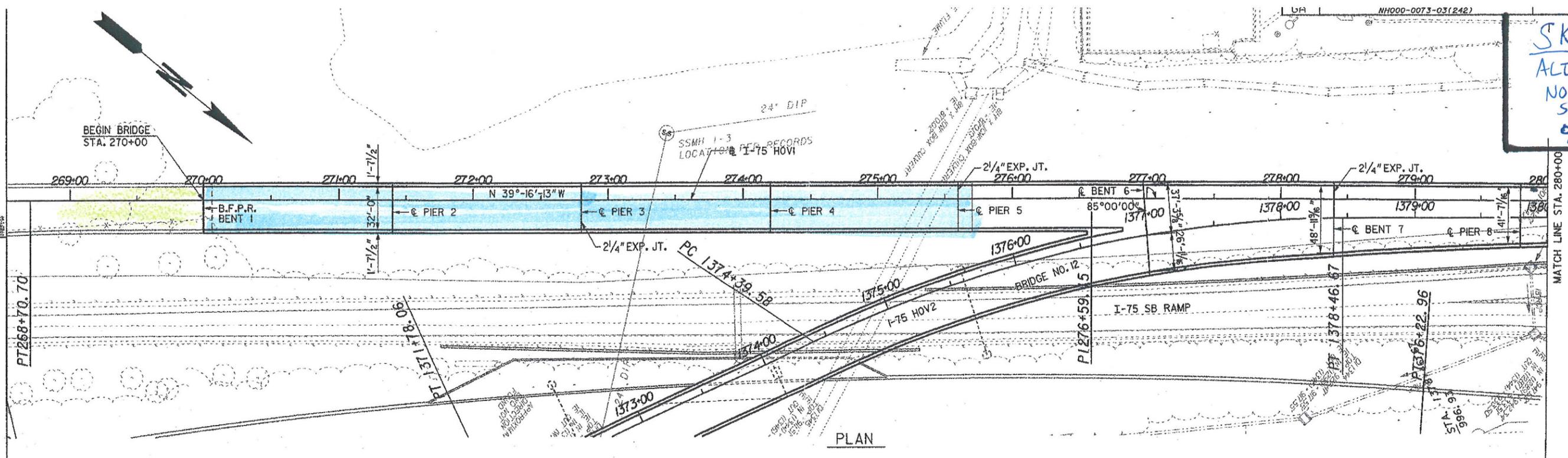
SCALE IN FEET  
0 50 100 200



1-75 / 1-575 NORTHWEST CORRIDOR  
RETAINING WALL ENVELOPES

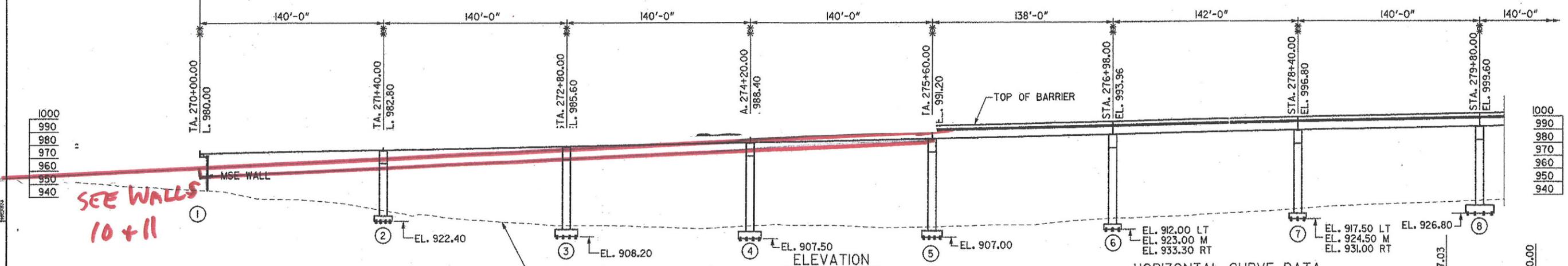
40  
DRAWING NO.  
31-12

SKETCH  
ALTERNATE  
NO. B-6  
SHEET  
9 OF 11



PLAN

TOTAL LENGTH OF BRIDGE = 3060'-0"



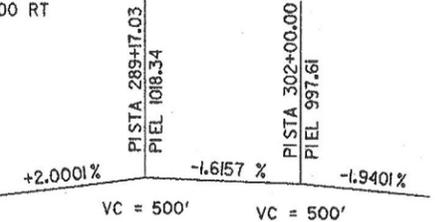
ELEVATION

BRIDGE CONSISTS OF

- 1 - 97'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 3 - 100'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 14 - 140'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 1 - 134'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 1 - 138'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 1 - 142'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 1 - 143'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 1 - 146'-0" BULB TEE, 74 IN, PSC BEAM SPANS ----- SPECIAL DESIGN
- 2 - STEEL H PILE END BENTS ----- SPECIAL DESIGN
- 19 - CONCRETE HAMMERHEAD PIERS ----- SPECIAL DESIGN
- 1 - CONCRETE STRADDLE BENT ----- SPECIAL DESIGN
- 1 - CONCRETE SHARED INTERMEDIATE BENT ----- SPECIAL DESIGN
- 1 - CONCRETE INTERMEDIATE BENT ----- SPECIAL DESIGN

HORIZONTAL CURVE DATA

⊕ I-75 HOV1  
PISTA. 285+14.33  
Δ = 15°00'04" RT.  
D = 1°44'37"  
T = 432.64 FT.  
L = 860.33 FT.  
R = 3286.00 FT.



GRADE DATA  
⊕ I-75 HOV1

NOTES:

\* STATIONS AND ELEVATIONS ARE ALONG ⊕ I-75 HOV1 AT THE INTERSECTION OF ⊕ I-75 HOV1 WITH B.F.P.R. OR ⊕ BENT / PIER.  
END BENT PILES NOT SHOWN.  
BENTS / PIERS ARE RADIAL.

DESIGN DATA  
SPECIFICATIONS ----- AASHTO 17TH EDITION, 2002  
(DESIGNED FOR SEISMIC PERFORMANCE CATEGORY A)  
TYPICAL HS20-44 AND/OR MILITARY LOADING ----- IMPACT ALLOWED  
FUTURE PAVING ALLOWANCE ----- 30 LBS PER SQ FT

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

PROJECT P.I. NO. 71430  
**BRIDGE NO. 13**

REVISIONS	
NO	DATE
A	6-30-09
B	9-25-09
C	11-30-09

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET  
0 40 80 160



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&J**

BRIDGE SHEET  
1 OF 9

I-75 / I-575 NORTHWEST CORRIDOR  
**I-75 REV. OVER WINDY HILL**  
STA. 270+00 TO STA. 300+60  
COBB COUNTY NH000-0073-03(242) DRAWING NO. 35-74

11/30/2009 10:27:51 AM

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130*  
*Cobb County, GA*

ALT. NO.:

**B-6**

SHEET NO.: 10 of 11

New Walls (Cont):

Wall Z-10:

$$\text{Area} = 181' \times (22.5' + 3') / 2 + 17.5' \times 40' / 2 = 2,658 \text{ sf}$$

Wall Z-11:

$$\text{Area} = 221' \times (22.5' + 3') / 2 + 17.5' \times 40' / 2 = 3,168 \text{ sf}$$

**SUM= 22,256 SF MSE**

**4,600 SF Tie-Back**

Roadway Pavement:

$$\text{Length: } (239+80 - 233+90) + (260+94 - 242+60) = 2,424 \text{ ft}$$

Width: 40.25'

$$\text{Area: } 2,424' \times 40.25' / 9 = \mathbf{10,840 \text{ SY}}$$

Calculations for the mainline Pavement Section Unit Cost (\$/SY):

$$12'' \text{ Plain Jointed Concrete Pavement:} \quad = \text{\$112 / SY}$$

$$3'' \text{ Asphaltic Concrete: } 330\#/\text{SY} \times \text{TN}/2000\# \times \$95/\text{TN} = \text{\$15.68 / SY}$$

$$12'' \text{ G.A.B.} \quad = \text{\$40 / SY}$$

$$\text{Total} \quad = \quad \mathbf{\text{\$167.68 / SY}}$$



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

ALTERNATIVE NO.:  
**B-13**

DESCRIPTION: **ELIMINATE BRIDGE NO. 16 ON I-75 BY MITIGATING  
 WETLANDS AND EXTENDING BOX CULVERTS**

SHEET NO.: **1 of 5**

**ORIGINAL DESIGN:** (sketch attached)

Bridge No. 16 starts at station 394+10 and ends at station 406+70 for a total length of 1,260 feet.

**ALTERNATIVE:** (sketch attached)

From station 394+10 to station 406+70, construct 1,260 feet of road with mechanically stabilized embankment (MSE) walls. This will be achieved by mitigating a 20 foot width of wetlands from station 396+74 to station 406+24 for a total length of 950 feet. Thus, the area of wetlands that will be mitigated will be 19,000 square feet or 0.436 acre. Extend four 10 ft. x 10 ft. box culverts 60 ft. underneath the proposed managed lanes. Build two, 12-in.-thick concrete, 20 ft. x 10 ft. wing walls.

**ADVANTAGES:**

- Saves significant material and labor requirements
- Saves construction time
- Eliminates bridge maintenance requirements

**DISADVANTAGES:**

- Wetlands will have to be mitigated and the permitting process through United States Army Corps of Engineers (USACE) can be long. However there is room to provide mitigation at the I-75/I-575 interchange
- Increases road maintenance requirements – though it will be less than that required to maintain an equivalent length of the bridge

**DISCUSSION:**

Discussions with a wetlands specialist informed us that for an area of 0.436 acre, a maximum of five credits will be needed to mitigate the wetlands. Each credit is expected to cost about \$8,000. Therefore, the cost to mitigate the wetlands will be around \$40,000. Since the area is less than 0.5 acre, a nationwide permit could be filed with USACE. The approval usually takes no more than three months. However, if USACE determines that more than 0.5 acre of wetlands will need to be mitigated, then an individual permit will have to be filed. The approval of an individual permit can take a year or more and will increase the time and cost to complete the project.

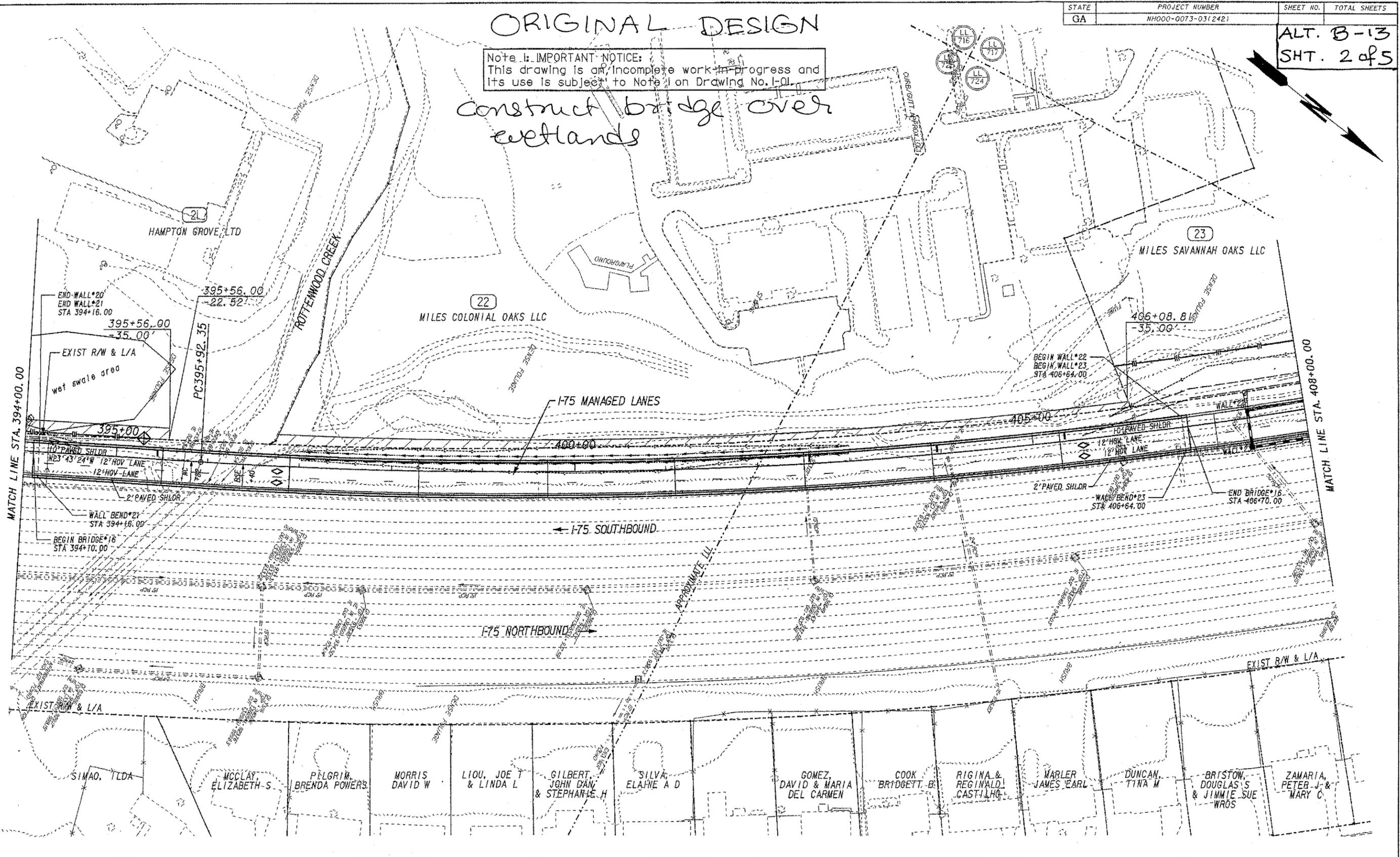
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 17,522,000	—	\$ 17,522,000
ALTERNATIVE	\$ 13,616,000	—	\$ 13,616,000
SAVINGS (Original minus Alternative)	\$ 3,906,000	—	\$ 3,906,000

ALT. B-13  
SHT. 2 of 5

# ORIGINAL DESIGN

Note: IMPORTANT NOTICE:  
This drawing is an incomplete work in progress and  
its use is subject to Note on Drawing No. I-01.

Construct bridge over  
wetlands



27-NOV-2009 15:21  
 11/27/2009  
 0:\175\ogn\714130\PRE.dgn

TRACKING	
CLARA CASH DRAWN BY	9/23/09
CHECKED BY	
SUPERVISOR	
APPROVED	

**GTP** GEORGIA TRANSPORTATION PARTNERS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	FCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	FCT	MRM	RHM
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

SCALE IN FEET  
0 50 100 200



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&**

I-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PLAN  
I-75 REVERSIBLE

DRAWING NO. 13-16

# ALTERNATE DESIGN

Note: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

Construct MSE WALLS by mitigating wetlands and extending Box culvert

Do not end wall  
Continue #20 & #21

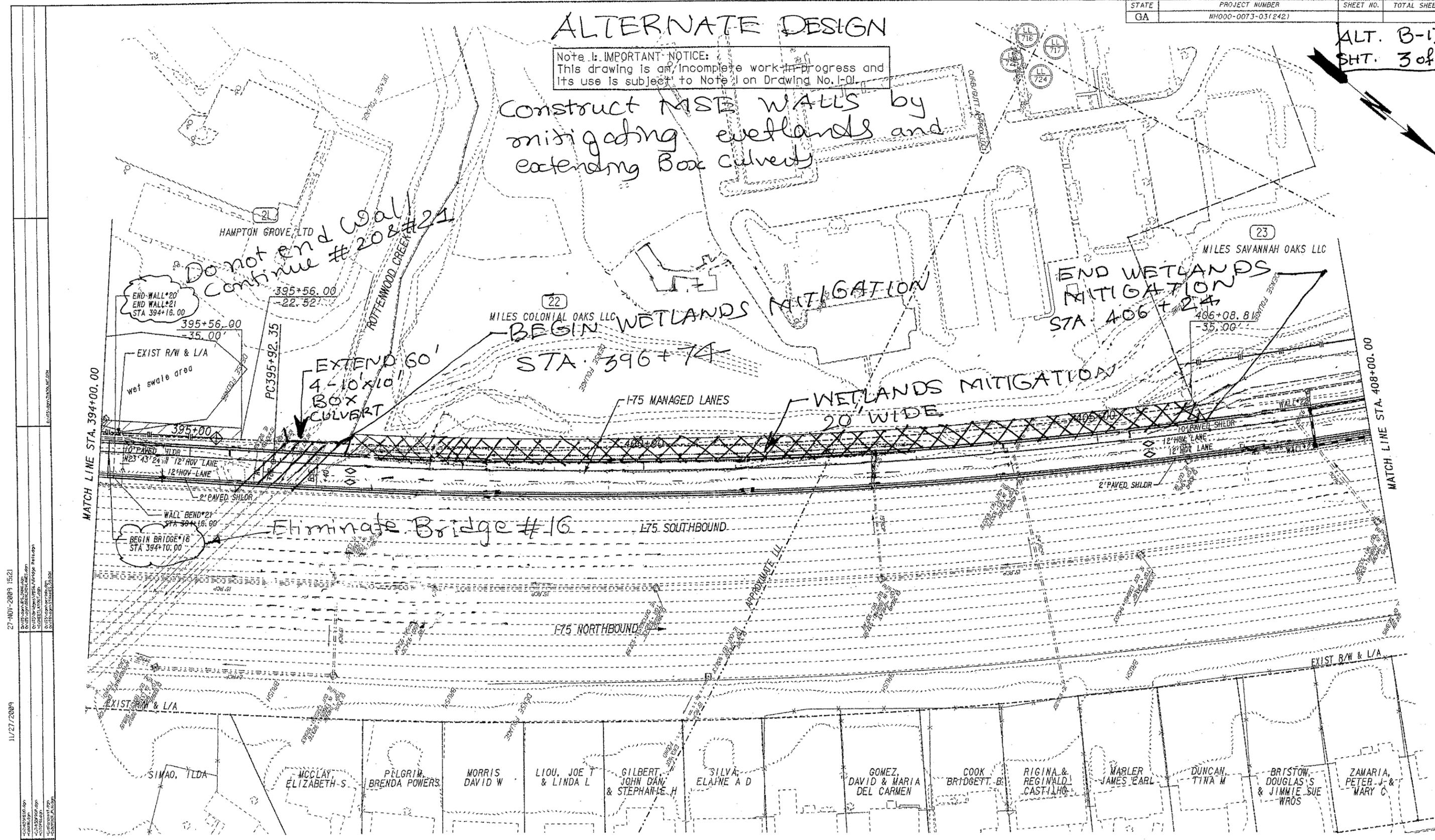
END WETLANDS  
MITIGATION  
STA 406+24

BEGIN WETLANDS  
MITIGATION  
STA 396+74

EXTEND 60'  
4-10'x10'  
BOX  
CULVERT

WETLANDS MITIGATION  
20' WIDE

Eliminate Bridge #16



27-NOV-2009 15:21  
11/27/2009  
0-175.dgn 714136CP016.dgn

TRACKING						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	PCT	MRM	RHM
C	1/30/09	PLOTTED PER CDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET  
0 50 100 200



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&**

I-75 / I-75 NORTHWEST CORRIDOR

**MAINLINE PLAN**

I-75 REVERSIBLE

DRAWING No. 13-16 46

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
Cobb and Cherokee Counties, GA

ALT. NO.:

**B-13**

SHEET NO.: 4 of 5

As designed bridge: \$283.00/sf

Bridge length: 394+10 to 406+70 = 1,260 lf

Bridge width: 47.25 lf

Area: 1,260 x 47.25 = 59,535 sf

The cost of concrete barriers is not included since the road with MSE walls will also require concrete barriers.

Calculations for the mainline Pavement Section Unit Cost:

12" Plain Jointed Concrete Pavement: = \$112.00/sy

3" Asphaltic Concrete: 330#/SY x TN/2000# x \$95/TN = \$ 15.68/sy

12" G.A.B. = \$ 40.00/sy

Total = \$167.68/sy

Road length: 394+10 to 406+70 = 1,260 lf

Area: (1,260 x 47.25)/9 = 6,615 sy

MSE Walls: \$117.00/sf

Wall length: 394+16 to 406+70 = 1,254 lf

Average wall height on the wetlands side: 30'

Area of wall on the wetlands side: 30 x 1,254 = 37,620 sf

Average wall height on the freeway side: 20'

Area of wall on the freeway side: 20 x 1,254 = 25,080 sf

Total wall area: 37,620 + 25,080 = 62,700 sf

Earthwork: \$68.00/cy

Average soil depth: (30 + 20)/2 = 25' Width of the road: 47.25'

Soil volume: (25 x 47.25 x 1,254)/27 = 54,863 cy

Wetlands: 10 credits/acre

Length: 396+74 to 406+24 = 950'

Width: 20'

Area: (950 x 20)/43,560 = 0.436 acre

Credits: 0.436 x 10 = 4.36 credits say 5 credits

Four 10'x10' Box Culverts with Wingwalls:

Total length: 4 x 60 = 240 lf

Two Wing walls: 2(20' x 10' x 1')/27 = 14.8 say 15 cy of Class 'A' Concrete



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-15**

DESCRIPTION: **USE MECHANICALLY STABILIZED EMBANKMENT**  
**ABUTMENTS IN LIEU OF END SPANS AT THE HICKORY**  
**GROVE ROAD BRIDGES OVER I-75**

SHEET NO.: 1 of 5

**ORIGINAL DESIGN:** (sketch attached)

Bridge Nos. 34A and 34B at Hickory Grove Road have two spans, a 133 ft. span over I-75 and a 77 ft. end span.

**ALTERNATIVE:** (sketch attached)

Use mechanically stabilized embankment (MSE) wall abutments with a single girder span of 138 ft.

**ADVANTAGES:**

- Reduces material and labor requirements
- Reduces bridge area to maintain
- Eliminates intermediate bents

**DISADVANTAGES:**

- Maintenance of wall/bridge interface is required

**DISCUSSION:**

Using MSE walls parallel to I-75 with the front face of the wall at the same location as the face of the column in the original design greatly reduces the bridge area. This also eliminates the construction of an intermediate bent on each bridge.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 8,748,000	—	\$ 8,748,000
ALTERNATIVE	\$ 6,583,000	—	\$ 6,583,000
SAVINGS (Original minus Alternative)	\$ 2,165,000	—	\$ 2,165,000

# SKETCH



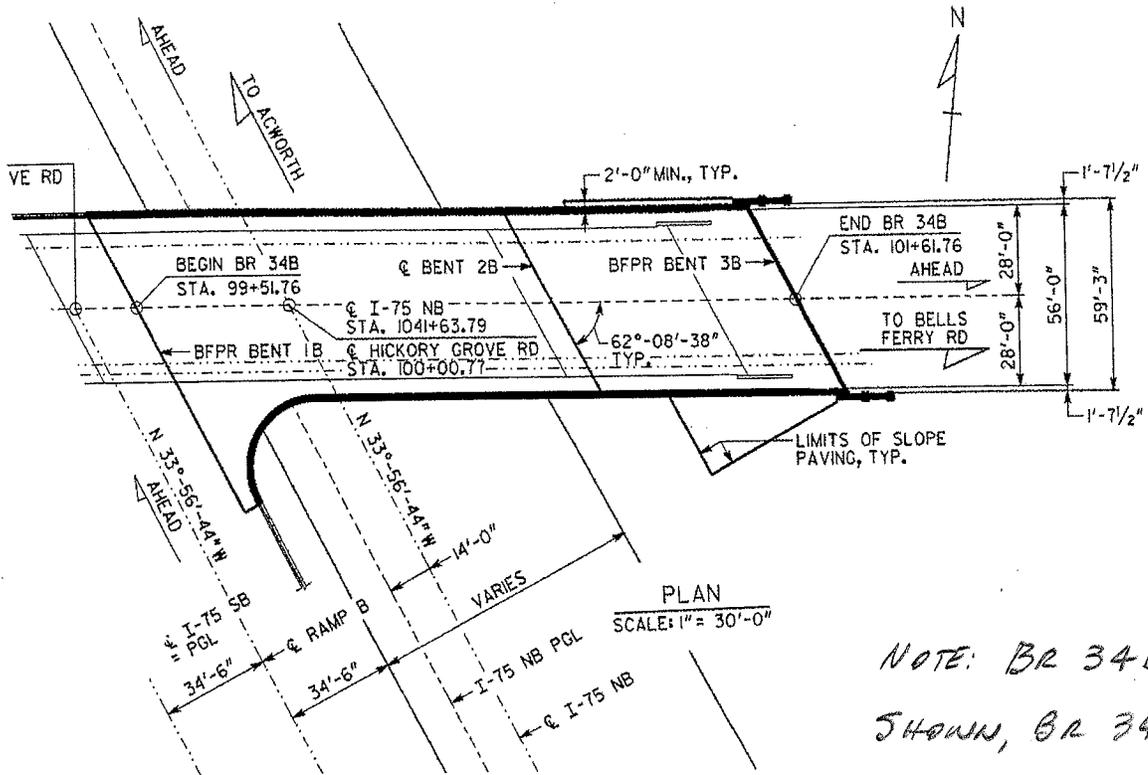
PROJECT: **I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD  
FOR HOV LANES**  
NH000-0073-03(242), P.I. No. 714130  
Cobb County, GA

ALTERNATIVE NO.:

*B-15*

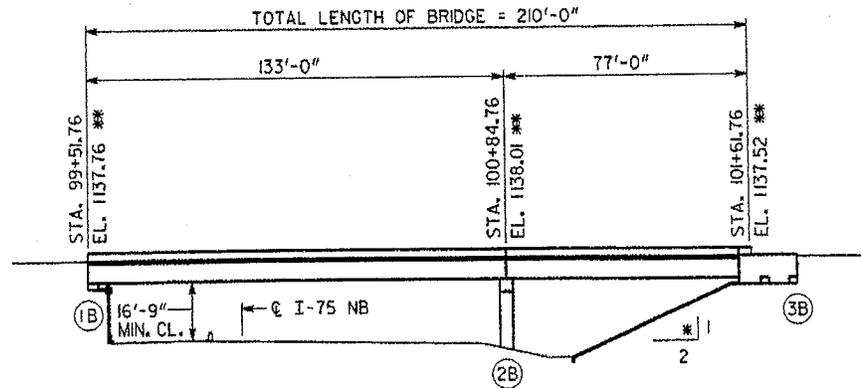
ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: 2 of 5



PLAN  
SCALE: 1" = 30'-0"

NOTE: BR 34B  
SHOWN, BR 34A  
SIMILAR



ELEVATION  
SCALE: 1" = 30'-0"

# SKETCH



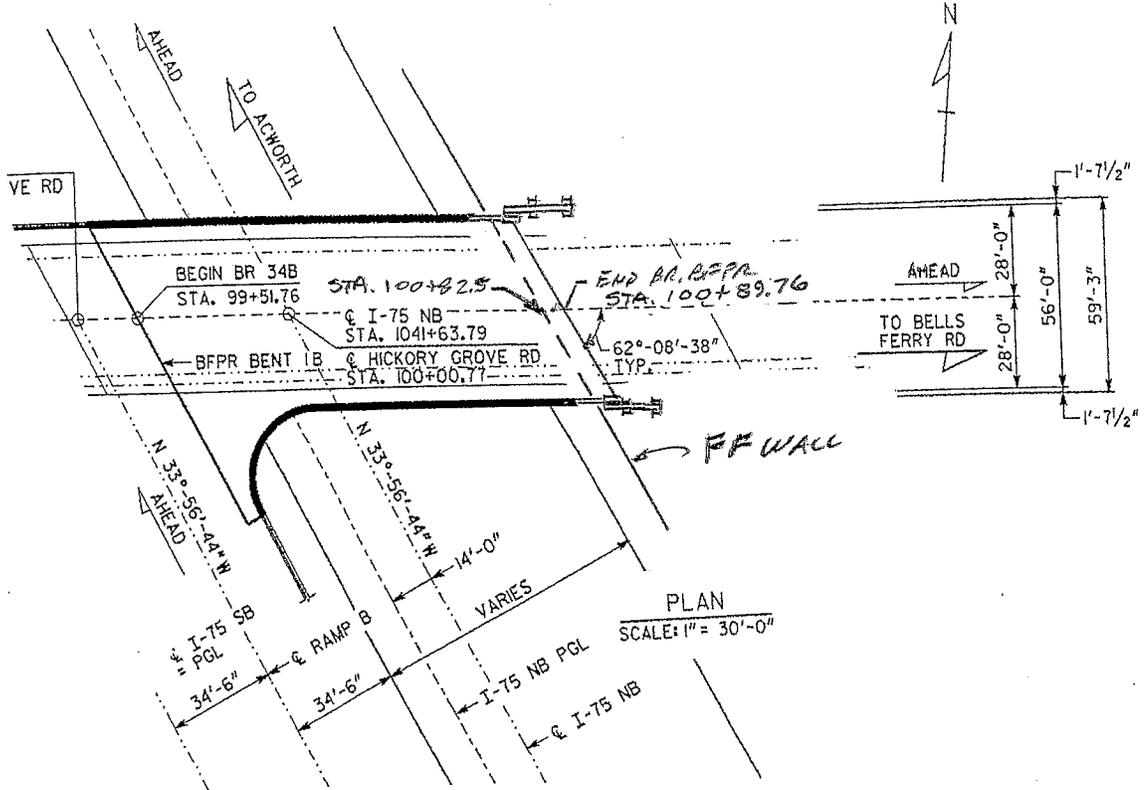
PROJECT: **I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD  
FOR HOV LANES**  
 NH000-0073-03(242), P.I. No. 714130  
 Cobb County, GA

ALTERNATIVE NO.:

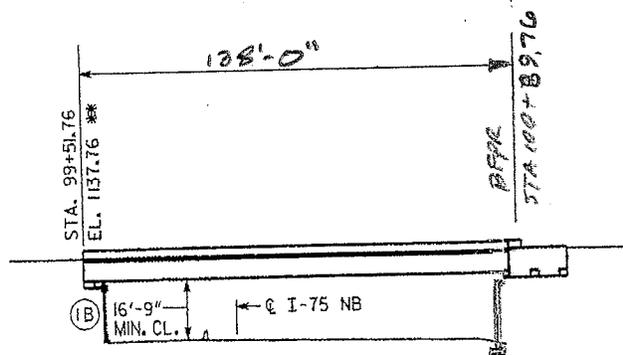
*B-15*

ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: **3** of **5**



*NOTE: BR 34B  
SHOWN. BR 34A  
SIMILAR*



ELEVATION  
SCALE: 1" = 30'-0"

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-15**

SHEET NO.: 4 of 5

## Original Design:

$$\text{Bridge Area} = 2(210)(59.25) = 24,885 \text{ SF}$$

## Alternative Design:

$$\alpha = 62^\circ-08'-38'' = \text{Skew angle}$$

$$\text{Wall H} = 20 \text{ feet under the bridge}$$

$$\text{Wall L} = [59.25 + 2(10)] + 2[2(20)/\sin \alpha] = 170 \text{ LF}$$

$$\text{Wall Area} = 79.25(20+2) + [.5(2+22)(170-79.5)] = 2830 \text{ X } 2 \text{ walls} = 5660 \text{ SF}$$

$$\text{Bridge Area} = 2(138)(59.25) = 16,353 \text{ SF}$$

$$\text{Additional MSE Backfill} = (59.25/\sin \alpha)(8.5)(18)/27 = 380 \text{ CY X } 2 \text{ walls} = 760 \text{ CY}$$

$$\text{For Additional MSE Backfill Cost, use } 3(34.37) = \$105/\text{CY}$$

$$\text{Additional Pavement: } 2(56)(210-138)/9 = 900 \text{ SY}$$

Pavement Section Unit Cost (\$/SY):

$$12'' \text{ Plain Jointed Concrete Pavement:} \quad = \$112 / \text{SY}$$

$$3'' \text{ Asphaltic Concrete: } 330\#/\text{SY} \times \text{TN}/2000\# \times \$95/\text{TN} = \$15.68 / \text{SY}$$

$$12'' \text{ G.A.B.} \quad = \underline{\underline{\$40 / \text{SY}}}$$

$$\text{Total} \quad = \quad \$167.68 / \text{SY}$$



# VALUE ENGINEERING ALTERNATIVE



**PROJECT: I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-17**

**DESCRIPTION: USE A LARGER RADIUS FOR BRIDGE NO. 7 OVER I-285 AND SHORTEN THE BRIDGE**

SHEET NO.: 1 of 5

**ORIGINAL DESIGN:** (sketch attached)

The original design includes Bridge No. 7, which is 2,211 feet long and goes slightly west before turning to go towards the east to connect the new Managed, Reversible Lanes to I-285 westbound.

**ALTERNATIVE:** (sketch attached)

Use a bridge with larger radius curves to go more directly to the east, shortening the bridge length to 2,056 feet.

**ADVANTAGES:**

- Less bridge construction
- Reduces construction time
- Less bridge to maintain
- Reduces material requirements

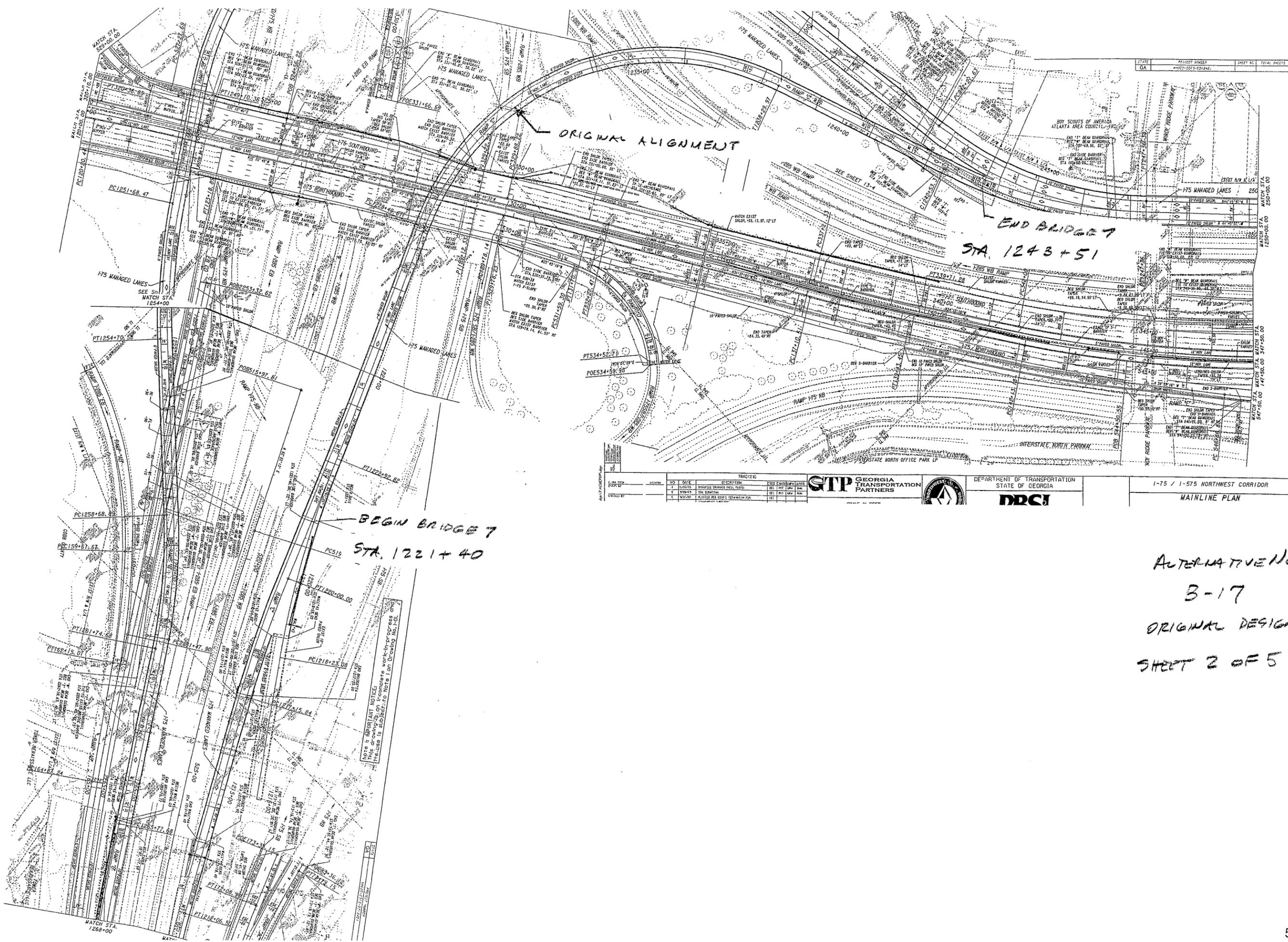
**DISADVANTAGES:**

- Crosses I-75 at more of a skew

**DISCUSSION:**

This bridge carries traffic from I-285 westbound to the I-75 northbound managed lanes. On the north end of the bridge in the original design, the bridge stays on the alignment of Bridge 2A, which turns west before separating to turn towards the east. The alternative design continues the tangent towards the south before following a larger radius curve towards the east. While the alternative alignment crosses I-75 at more of a skew, the spans on this bridge will be long due to the length and height of the bridge, so crossing I-75 at more of an angle will not be problematic. The bridge length is reduced by 155 feet and significant costs are saved.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 30,639,000	—	\$ 30,639,000
ALTERNATIVE	\$ 28,491,000	—	\$ 28,491,000
SAVINGS (Original minus Alternative)	\$ 2,148,000	—	\$ 2,148,000



PROJECT NUMBER	GA
SHEET NO.	25
TOTAL SHEETS	25

NO.	DATE	DESCRIPTION	BY	CHKD.	APP'D.
1	10/15/15	ISSUED FOR PERMITS	JL	ML	ML
2	10/20/15	REVISED PER COMMENTS	JL	ML	ML

**STP** GEORGIA TRANSPORTATION PARTNERS

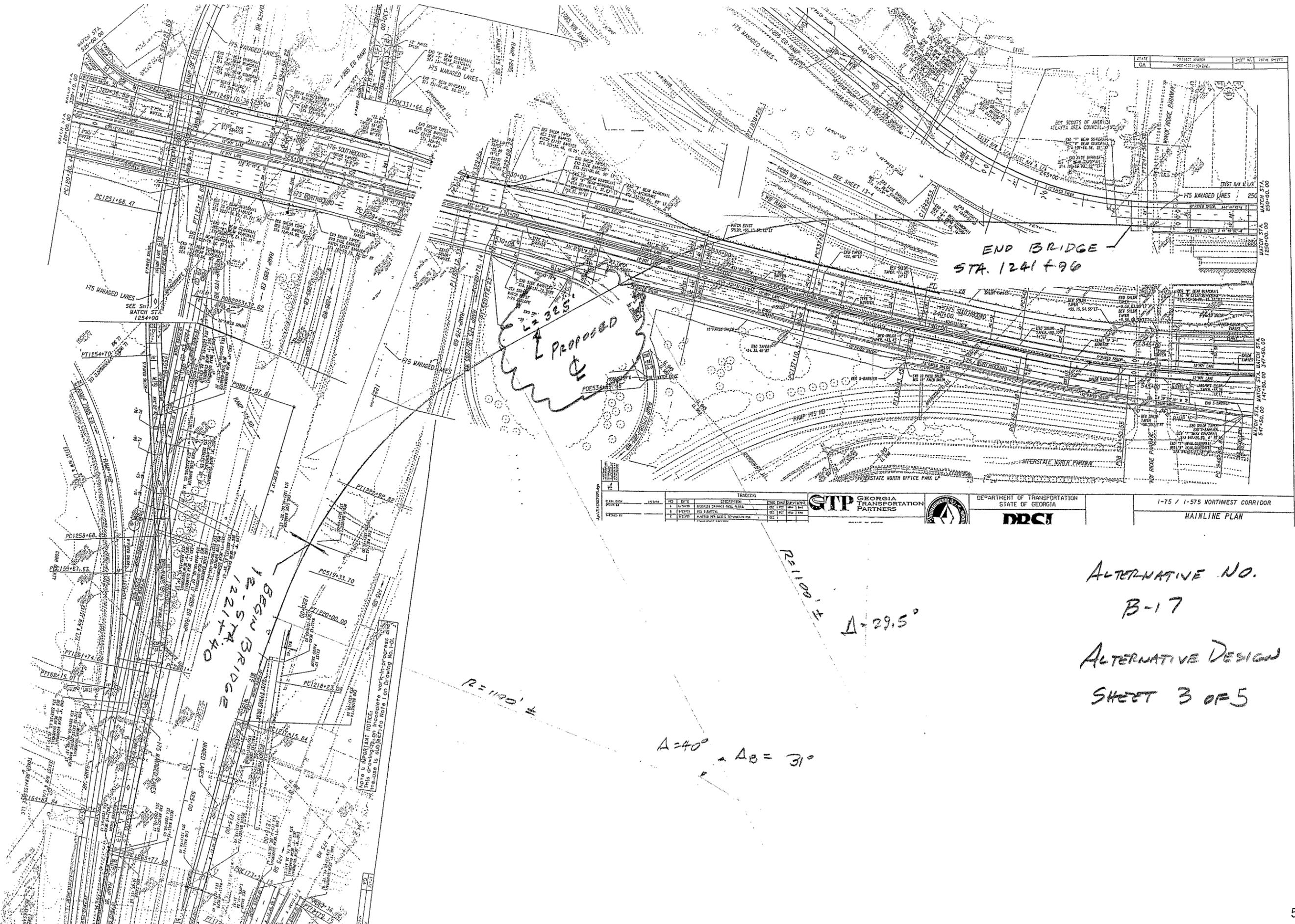


DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
**DRCS**

1-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PLAN

NOTE TO CONTRACTOR: This drawing is preliminary work in progress. Its use is subject to Note 1 on Drawing No. 1-01 and 1-02.

ALTERNATIVE NO.  
B-17  
ORIGINAL DESIGN  
SHEET 2 OF 5



END BRIDGE - STA. 1241+90

Proposed  
Q

BEGIN BRIDGE  
12. STA. 1221+40

R=1100' ±

Δ=29.5°

Δ=40°  
ΔB=31°

NOTE: IF IMPORTANT NOTICE  
drawing information  
is subject to more for drawing

TRACKING		DATE		BY	
1	DESIGN	10/15/11	10/15/11	10/15/11	10/15/11
2	PROJECT CHANGE				
3	DESIGN				
4	DESIGN				
5	DESIGN				
6	DESIGN				
7	DESIGN				
8	DESIGN				
9	DESIGN				
10	DESIGN				



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
DRCI

I-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PLAN

ALTERNATIVE NO.  
B-17  
ALTERNATIVE DESIGN  
SHEET 3 OF 5

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-17**

SHEET NO.: 4 of 5

## ORIGINAL DESIGN

Bridge length = 2,211'-0"    Bridge Width = 35'-3"  
Bridge Area = 2,211(35.25) = 77,938 SF

## ALTERNATIVE DESIGN

Bridge Length = 2,056'-0"    Bridge Width 35'-3"  
Bridge Area = 2,056(35.25) = 72,474 SF



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**B-18**

DESCRIPTION: **SHORTEN BRIDGE NO. 2B OVER I-285 BY MOVING THE  
 CURVE TO THE NORTH**

SHEET NO.: 1 of 5

**ORIGINAL DESIGN:** (sketch attached)

The original design includes Bridge No. 2B over I-285 that is 2,863 feet long and starts off at the managed lanes Bridge No. 2A, curves to the east over I-75 and over the I-285 eastbound collector-distributor lanes, and then curves south before merging into the future I-285 eastbound managed lanes.

**ALTERNATIVE:** (sketch attached)

Use a bridge that is nearer to the existing southbound flyover bridge, shortening the bridge length to 2,805 feet.

**ADVANTAGES:**

- Less bridge construction
- Reduces construction time
- Less bridge to maintain
- Reduces cost

**DISADVANTAGES:**

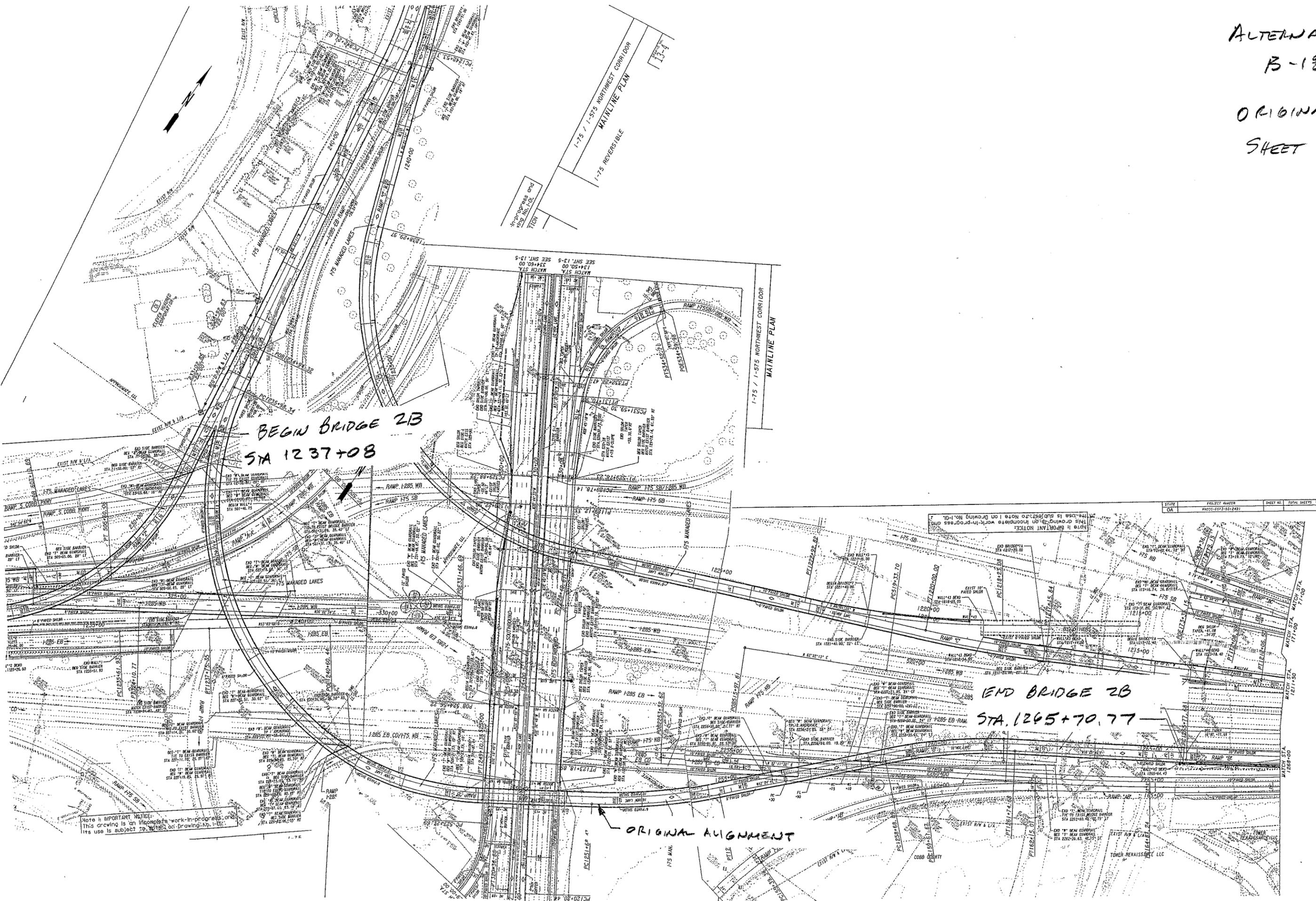
- None apparent

**DISCUSSION:**

This bridge will carry traffic from the I-75 southbound managed lanes to the I-285 eastbound managed lanes. In the original design, the bridge alignment is approximately 300 feet southwest of the existing flyover bridge. The alternative design moves the bridge to the north to stay closer to the existing flyover bridge and reduces the bridge length by 58 feet, thus saving costs.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 39,674,000	—	\$ 39,674,000
ALTERNATIVE	\$ 38,870,000	—	\$ 38,870,000
SAVINGS (Original minus Alternative)	\$ 804,000	—	\$ 804,000

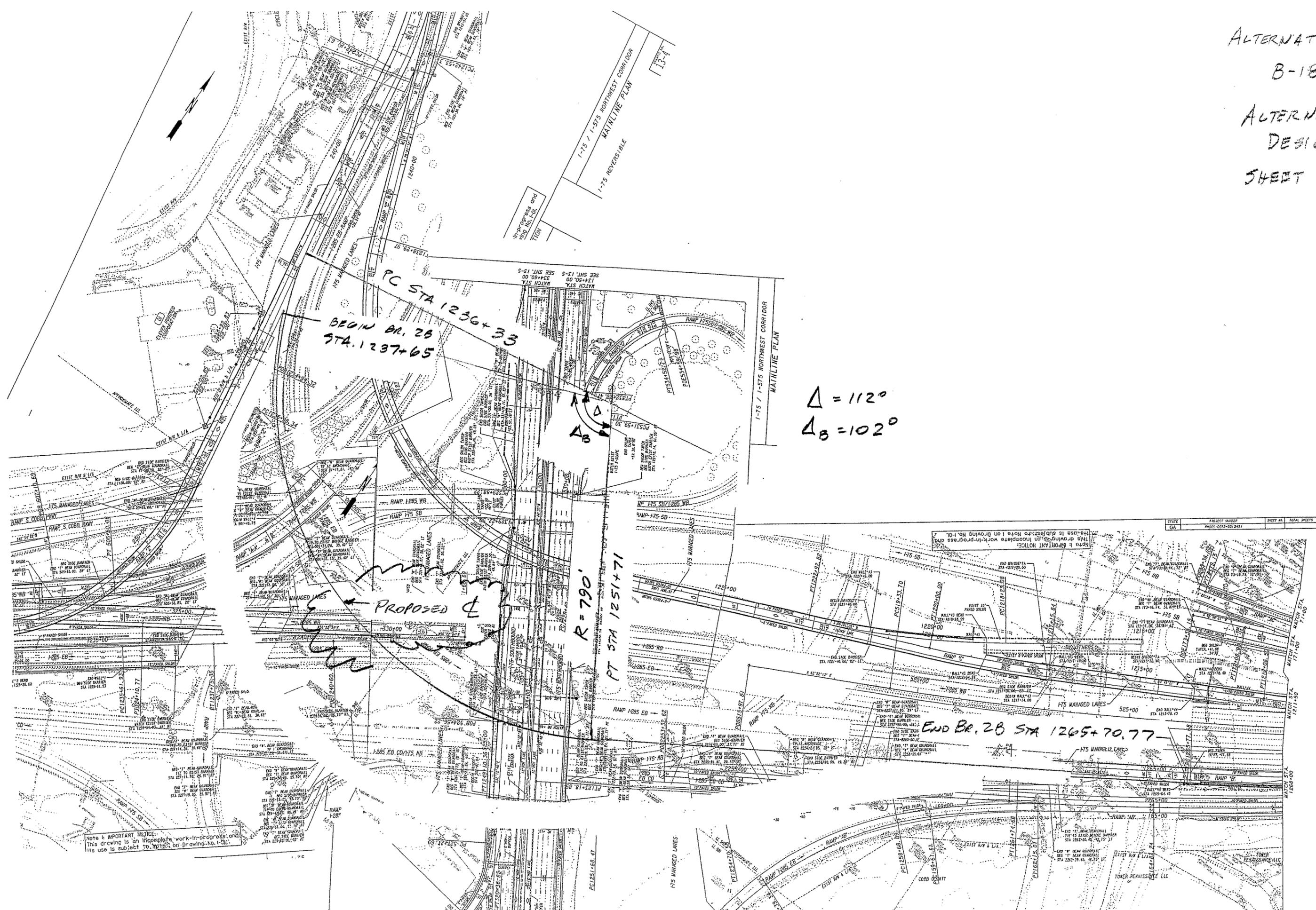
ALTERNATIVE NO.  
B-1B  
ORIGINAL DESIGN  
SHEET 2 OF 5



NOTE: IMPORTANT NOTICE  
This drawing is an incomplete work-in-progress and its use is subject to the notes on Drawing No. 1-B-1.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	HWY-1013-031242		

ALTERNATIVE NO  
 B-18  
 ALTERNATIVE  
 DESIGN  
 SHEET 3 OF 5



Note: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to the notes on Drawing No. 1-575

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	MS00-0013-031(24)		

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**B-18**

SHEET NO.: 4 of 5

## ORIGINAL DESIGN

Bridge length = 2,863'-0"    Bridge Width = 35'-3"  
Bridge Area = 2,863(35.25) = 100,921 SF

## ALTERNATIVE DESIGN

Bridge Length = 2,805'-0"    Bridge Width 35'-3"  
Bridge Area = 2,805(35.25) = 98,876 SF





# SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: I-75 REVERSIBLE LANES and I-575 REVERSIBLE LANES <i>Cobb and Cherokee Counties</i>		PRESENT WORTH OF COST SAVINGS				
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
<b>WALLS</b>						
W-1	At Big Shanty Road and I-75, move the entry and exit ramps to the reversible lane to the center of the median and delete the	\$6,053,000	\$944,000	\$5,109,000		\$5,109,000
W-2	Adjust the reversible lanes profile between South Marietta Parkway and Banberry Road to reduce the extent of the retaining walls	\$2,298,000	\$0	\$2,298,000		\$2,298,000
W-3	Adjust the reversible lanes profile on between Sta. 406+00 and Sta. 419+00 to reduce the extent of the retaining walls	\$3,276,000	\$0	\$3,276,000		\$3,276,000
<b>I-575</b>						
575-1	Move slip ramp (hot lane) at Hawkins Store Road to the north and off of the bridge over Hawkins Store Road	\$567,000	\$0	\$567,000		\$567,000
575-2	End the project on I-575 just south of the Little River Bridge by shifting the slip ramp to the south	\$3,642,000	\$0	\$3,642,000		\$3,642,000
<b>PAVEMENT</b>						
P-1	On the two-lane managed lanes section of I-75 use 11-ft.-wide lanes adjacent to the 10-ft.-wide shoulders	\$9,953,000	\$0	\$9,953,000		\$9,953,000
P-3	Underneath the concrete pavement, use 3 in. of soil-cement base in lieu of asphaltic concrete base the length of the project	\$10,192,000	\$1,625,000	\$8,567,000		\$8,567,000
P-4	Underneath the concrete pavement, delete the 3-in.-thick	\$10,192,000	\$0	\$10,192,000		\$10,192,000

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**W-1**

DESCRIPTION: **AT BIG SHANTY ROAD AND I-75 MOVE THE ENTRY AND EXIT RAMP TO THE REVERSIBLE LANE TO THE CENTER OF THE MEDIAN AND DELETE THE RETAINING WALL**

SHEET NO.: **1 of 12**

**ORIGINAL DESIGN:** (sketch attached)

Big Shanty Road is in the process of being constructed with the bridges for I-75 northbound and southbound over the road. As part of the reversible lane project, the northbound bridge will be expanded to accommodate the new I-75 reversible lane. Exit and entry ramps for Big Shanty Road will also be provided. According to the cross sections from Sta. 849+00 to Sta. 876+00, mechanically stabilized embankment (MSE) walls and bifurcated concrete traffic barriers will be constructed to separate the new reversible lane on I-75 from the entry and exit ramps leading to Big Shanty Road between these stations.

**ALTERNATIVE:** (sketch attached)

In order to build the I-75 bridges over Big Shanty Road, I-75 northbound and southbound traffic will be detoured into the median, thus this area will be cleared and leveled. To take advantage of this work and to eliminate the retaining wall, flare the exit and entry ramps toward the middle of the median and use a 2 horizontal to 1 vertical slope from the shoulder of the reversible lanes to the elevation of the entry and exit ramps.

**ADVANTAGES:**

- Eliminates retaining wall construction and its associated maintenance
- Reduces construction time
- Takes advantage of current construction activities

**DISADVANTAGES:**

- Increases excavation marginally (since the ground is fairly level in the median due to the temporary road construction for the bridge, the only extra excavation is a wedge along I-75)

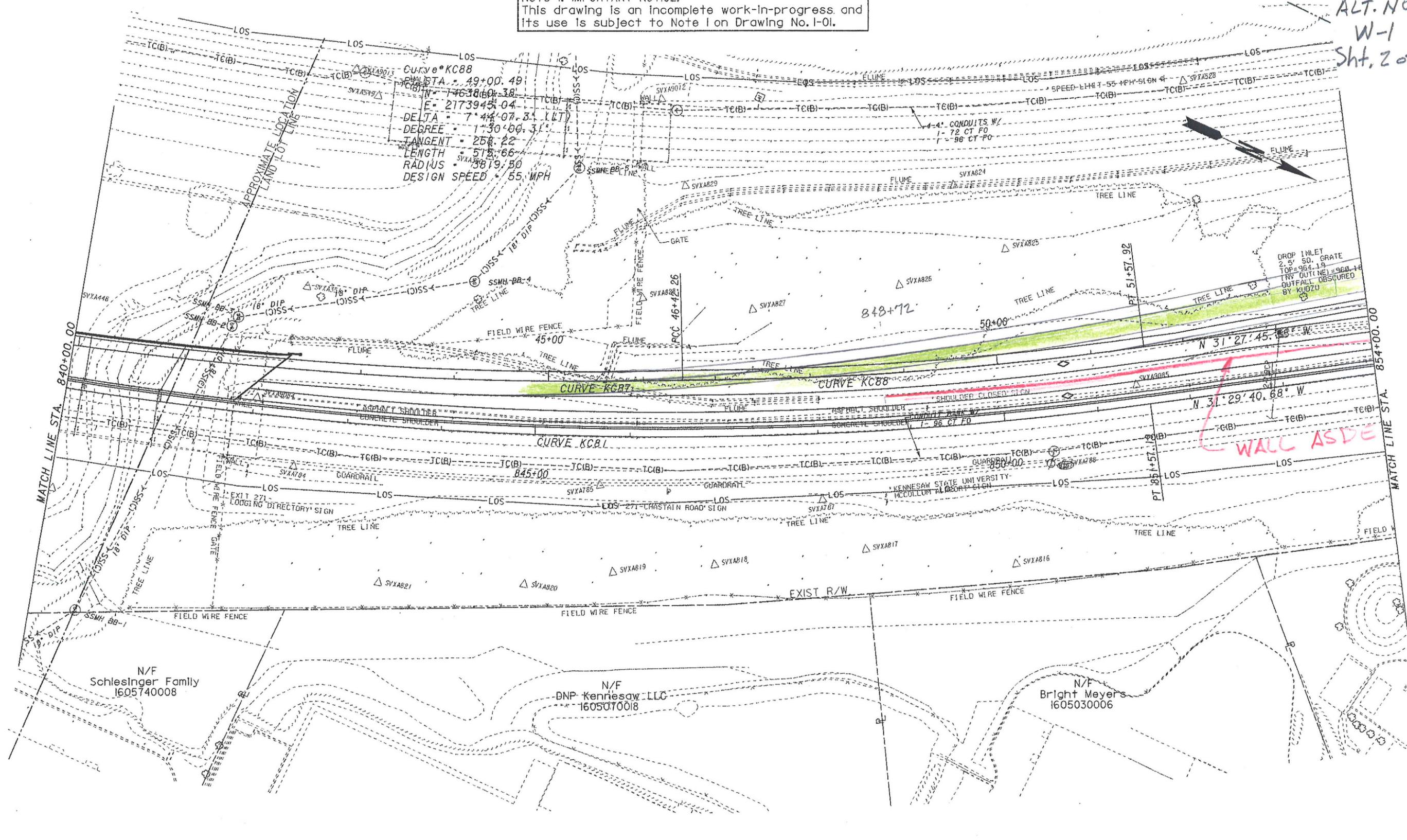
**DISCUSSION:**

Moving the ramps into the median avoids having to build MSE walls and bifurcated traffic barriers along the new I-75 reversible lane. This saves both labor and materials and eliminates the need to maintain these walls in the future.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 6,053,000	—	\$ 6,053,000
ALTERNATIVE	\$ 944,000	—	\$ 944,000
SAVINGS (Original minus Alternative)	\$ 5,109,000	—	\$ 5,109,000

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

ALT. No.  
W-1  
Sht. 2 of 12



N:\TRAV\255717\Drawings\Civil\Redy\714130CP47.dgn  
 25-NOV-2009  
 15:39

MINDY SANDERS	11/12/09
DRAWN BY	DATE
CHECKED BY	DATE
SUPERVISOR	DATE
APPROVED	DATE

REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners

SCALE IN FEET



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
2650, Heritage Court SE  
Suite 250  
Atlanta, Georgia 30339

I-75 / I-575 NORTHWEST CORRIDOR

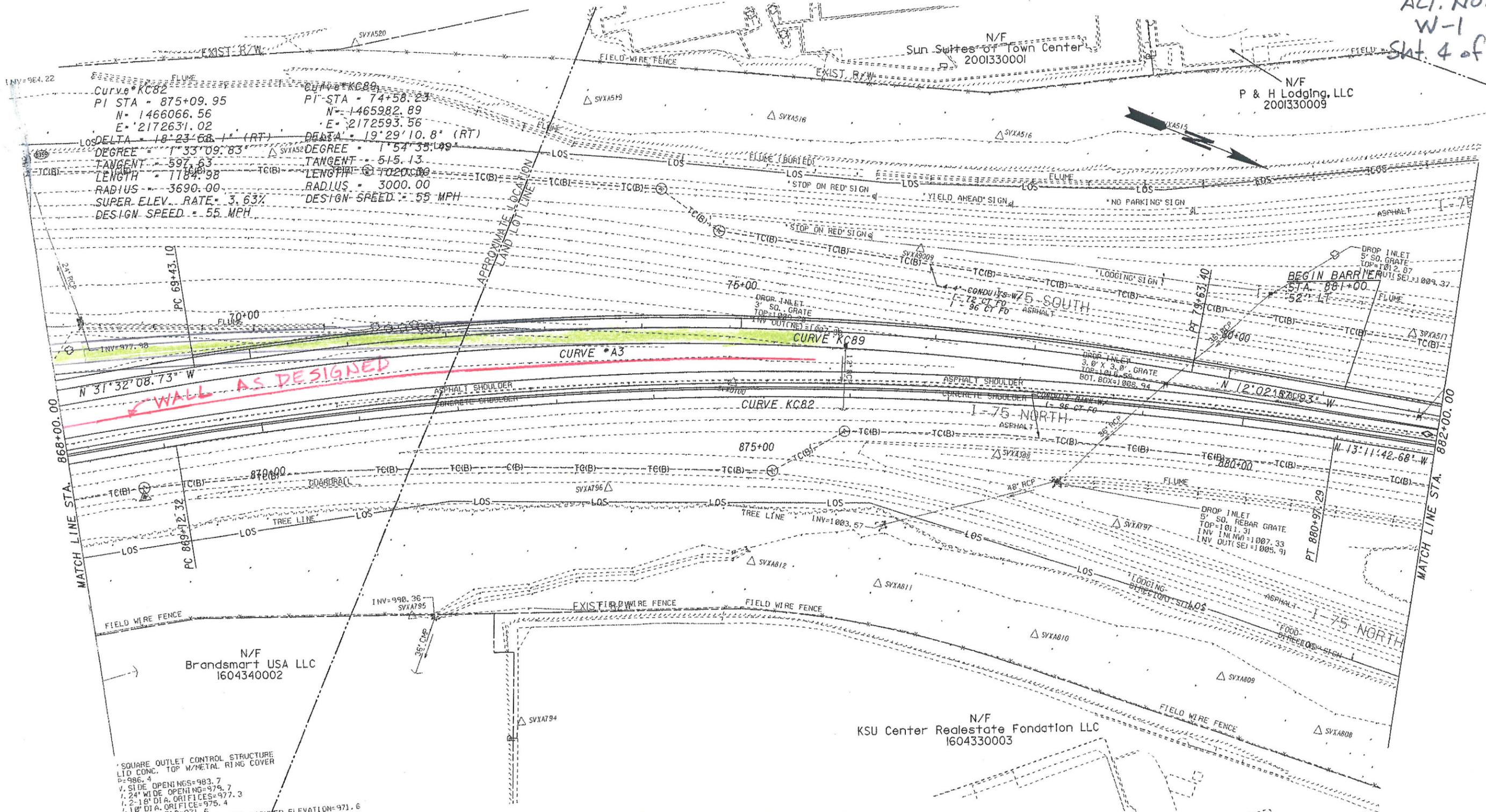
**MAINLINE PLAN**

I-75 REVERSIBLE MANAGED LANES

DRAWING No. 13<sup>6</sup>-47



ALT. NO.  
W-1  
Sht. 4 of 12



CURVE \*KC82  
 PI-STA = 875+09.95  
 N = 1466066.56  
 E = 2172631.02  
 LOS DELTA = 18°23'58" (RT)  
 DEGREE = 1°33'09.83  
 TANGENT = 597.63  
 LENGTH = 7784.98  
 RADIUS = 3690.00  
 SUPER. ELEV. RATE = 3.63%  
 DESIGN SPEED = 55 MPH

CURVE \*KC89  
 PI-STA = 74+58.23  
 N = 1465982.89  
 E = 2172593.56  
 LOS DELTA = 19°29'10.8" (RT)  
 DEGREE = 1°54'35.49  
 TANGENT = 515.13  
 LENGTH = 7020.00  
 RADIUS = 3000.00  
 DESIGN SPEED = 55 MPH

SQUARE OUTLET CONTROL STRUCTURE  
 LID CONC. TOP W/METAL RING COVER  
 P=986.4  
 V. SIDE OPENINGS=983.7  
 I. 24" WIDE OPENING=979.7  
 I. 2-18" DIA. ORIFICES=977.3  
 I. 18" DIA. ORIFICE=975.4  
 I. 12" DIA. DIP=971.6  
 .OUT 66" RCP-INACCESSIBLE ASSUMED ELEVATION=971.6

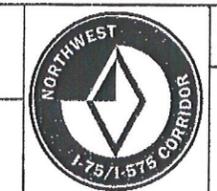
**Note 1: IMPORTANT NOTICE:**  
 This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

15:39  
 25-NOV-2009  
 N:\TRA\2555717.D\swings\Civil\94\714130CP49.dgn

		REVISIONS				
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	S.JL	S.JL	LFC
B	9/25/09	SOX SUBMITTAL	MHS	S.JL	S.JL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners

SCALE IN FEET  
 0 50 100 200



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

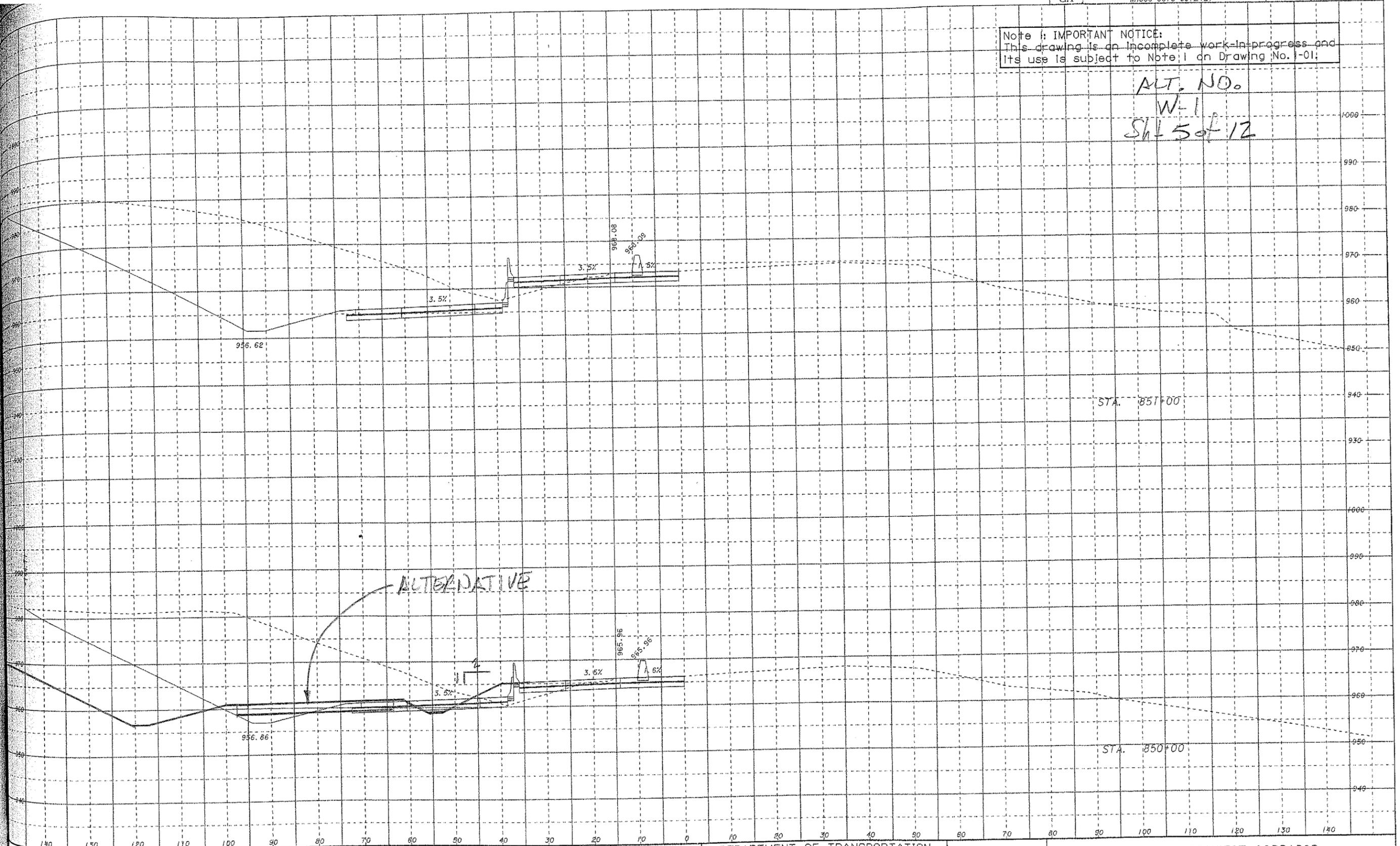
**JBT** J.B. TRIMBLE, INC.  
 2550. Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30329

I-75 / I-575 NORTHWEST CORRIDOR  
 MAINLINE PLAN

68  
 DRAWING NO. 13-49  
 I-75 REVERSIBLE MANAGED LANES

Note : IMPORTANT NOTICE:  
 This drawing is an Incomplete work-in-progress and  
 Its use is subject to Note:1 on Drawing No. 1-01.

ALT. NO.  
 W-1  
 SH 5 of 12



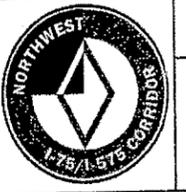
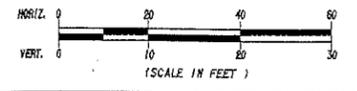
STA. 851+00

STA. 850+00

ALTERNATIVE

REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	S.J.L.	S.J.L.	LFC
B	9/25/09	50% SUBMITTAL	MHS	S.J.L.	S.J.L.	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2550, Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

1-75 NORTHWEST CORRIDOR

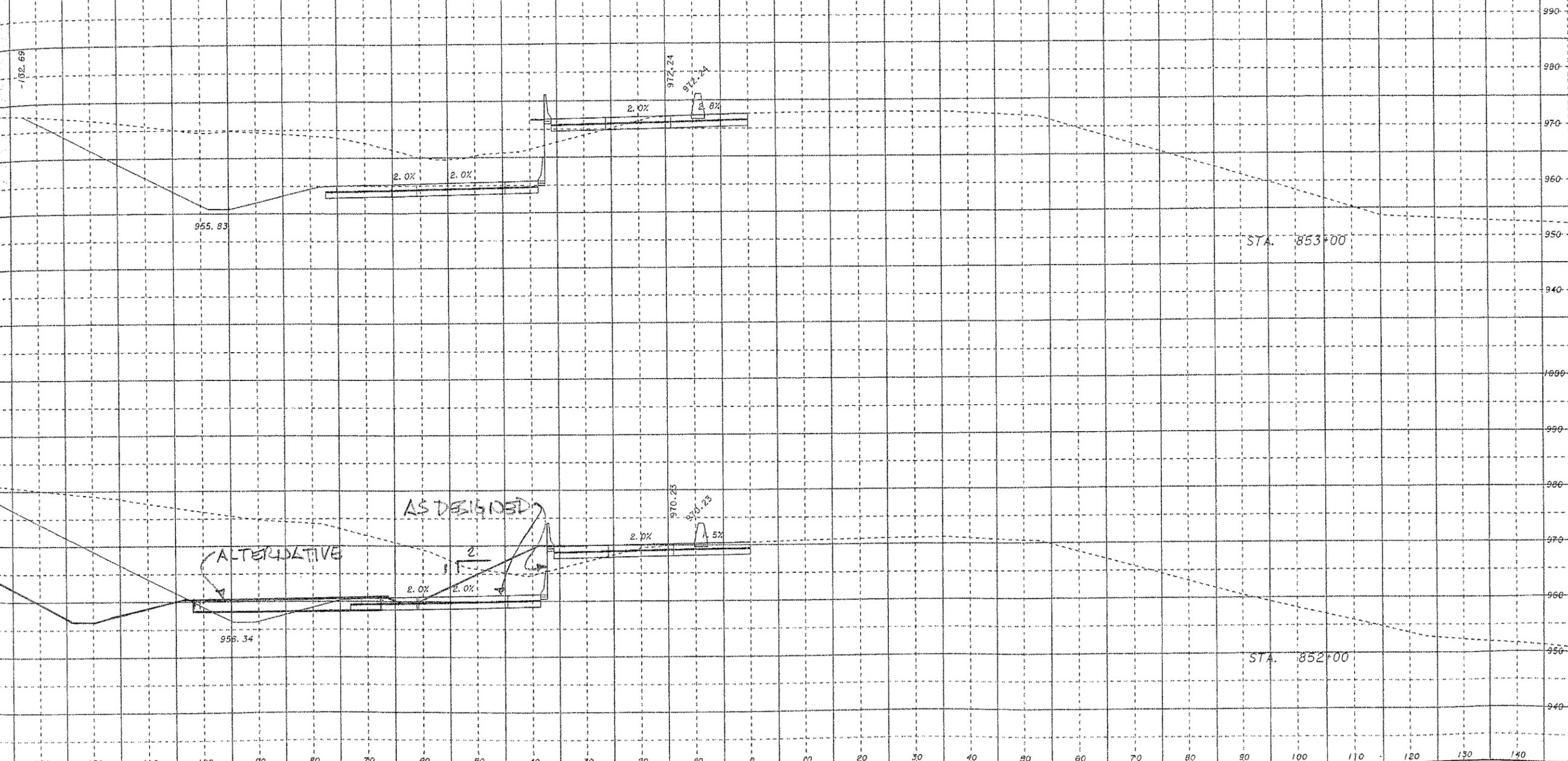
EARTHWORK CROSS SECTIONS

STA. 850+00 TO STA. 851+00  
 1-75 REVERSIBLE LANES

DRAWING No.  
**23-236**

Note 1: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. 1-01.

ACT. NO  
 W-1  
 SH. 6 of 12



REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2550. Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

1-75 NORTHWEST CORRIDOR

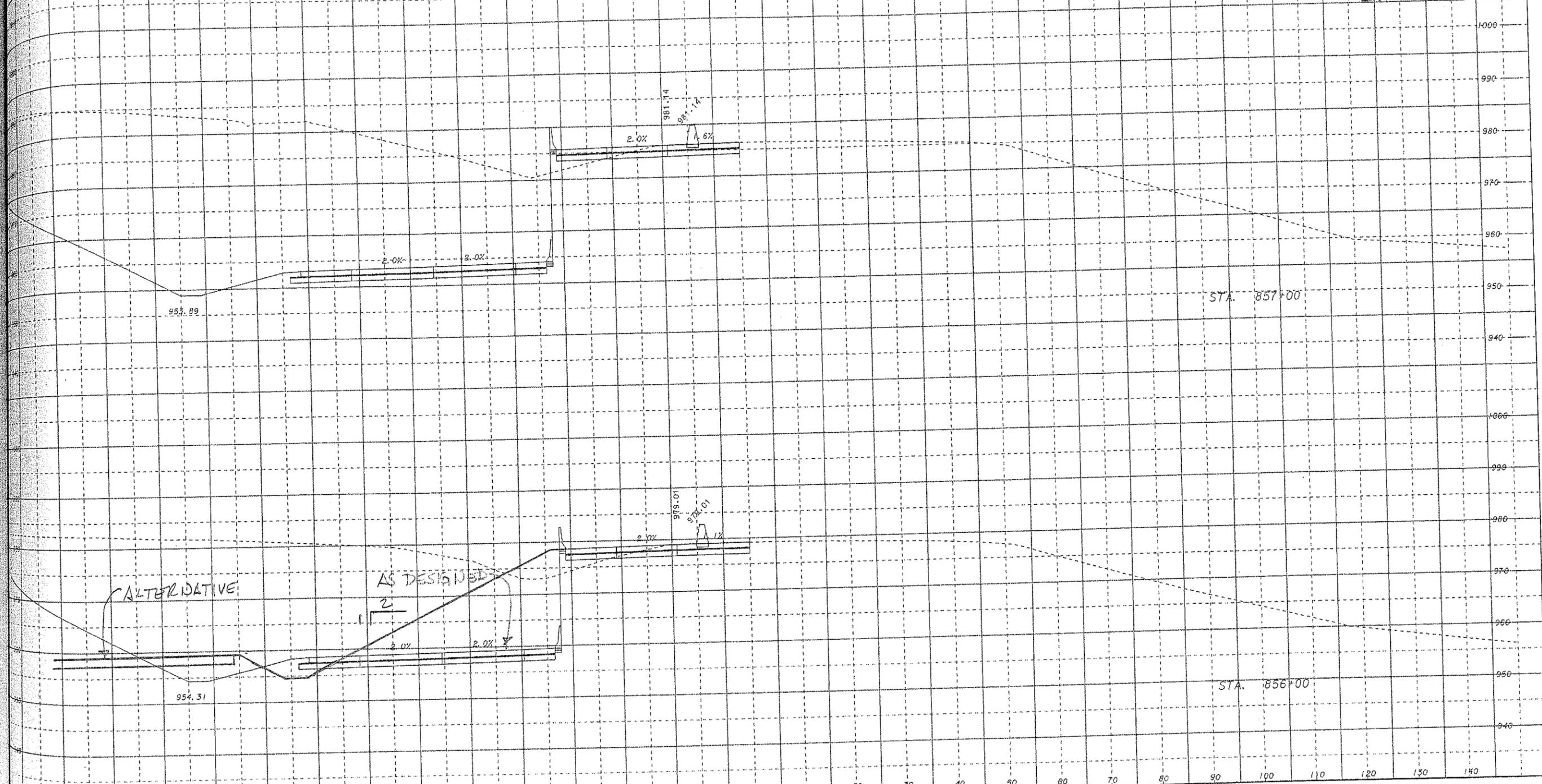
**EARTHWORK CROSS SECTIONS**

STA. 852+00 TO STA. 853+00  
 1-75 REVERSIBLE LANES

DRAWING No. 23-237

Note: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. 1-01.

ALT. NO.  
W-1  
Sht. 7 of 12



NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners

HORIZ. 0 20 40 60  
 VERT. 0 10 20 30  
 (SCALE IN FEET)



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
2550, Heritage Court SE  
Suite 250  
Atlanta, Georgia 30339

I-75 NORTHWEST CORRIDOR

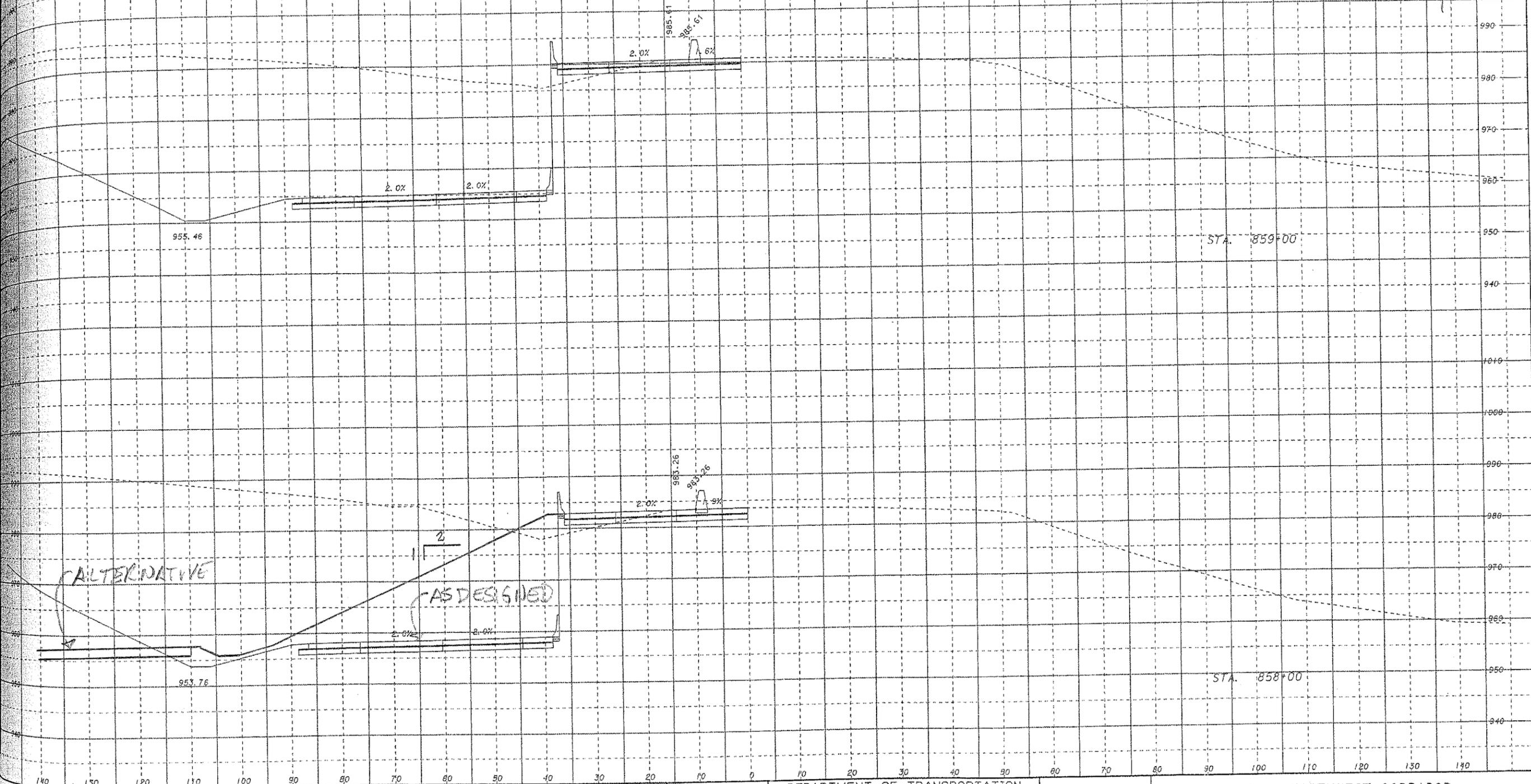
**EARTHWORK CROSS SECTIONS**

STA. 856+00 TO STA. 857+00  
I-75 REVERSIBLE LANES

DRAWING No. 23-239

Note: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. 1-01.

ACT. NO.  
 W-1  
 SH. 8 of 12



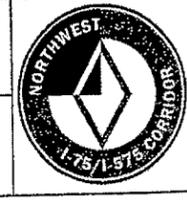
ALTERNATIVE

AS DESIRED

REVISIONS						
NO.	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners

HORIZ. 0 20 40 60  
 VERT. 0 10 20 30  
 (SCALE IN FEET)



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2550, Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

1-75 NORTHWEST CORRIDOR

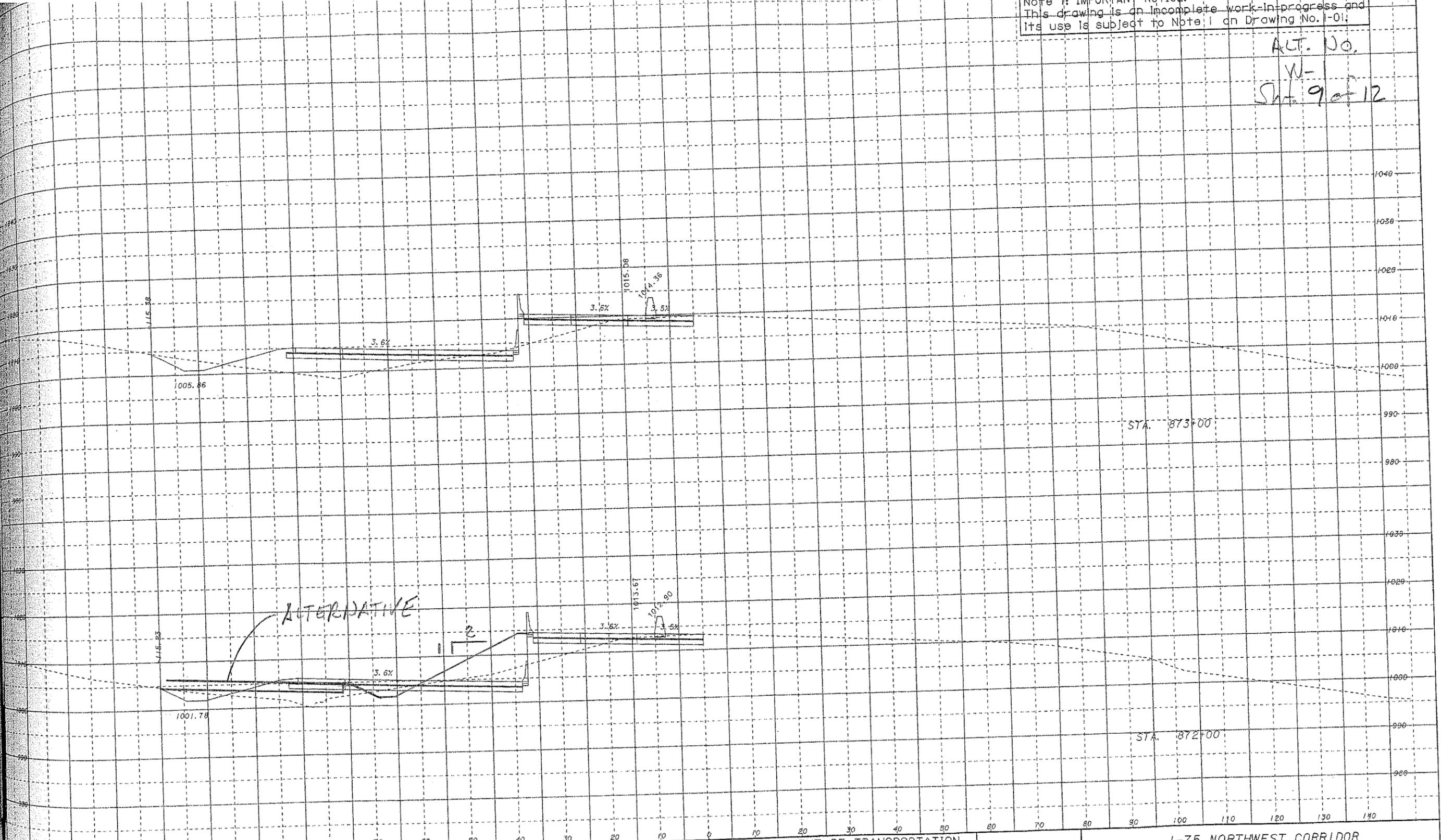
EARTHWORK CROSS SECTIONS

STA. 858+00 TO STA. 859+00  
 1-75 REVERSIBLE LANES

DRAWING No.  
**23-240**

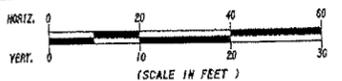
Note: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. 1-01.

ALT. No.  
 W-  
 Sht. 9 of 12



REVISIONS		NO	DATE	DESCRIPTION	ORIG	CHK	REUPV	APPR
					MHS	SJL	SJL	LFC
DATE	11/12/09	A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
DATE		B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
DATE		C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			
DATE								
DATE								

**GTP** Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2550, Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

1-75 NORTHWEST CORRIDOR

EARTHWORK CROSS SECTIONS

STA. 872+00 TO STA. 873+00  
 1-75 REVERSIBLE LANES

DRAWING No.  
**23-247**

Note 1: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. I-01.

ALT. No.  
 W-1  
 Sht 10 of 12



REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	MHS			

**GTP** Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2550, Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

1-75 NORTHWEST CORRIDOR

**EARTHWORK CROSS SECTIONS**

STA. 874+00 TO STA. 875+00  
 1-75 REVERSIBLE LANES

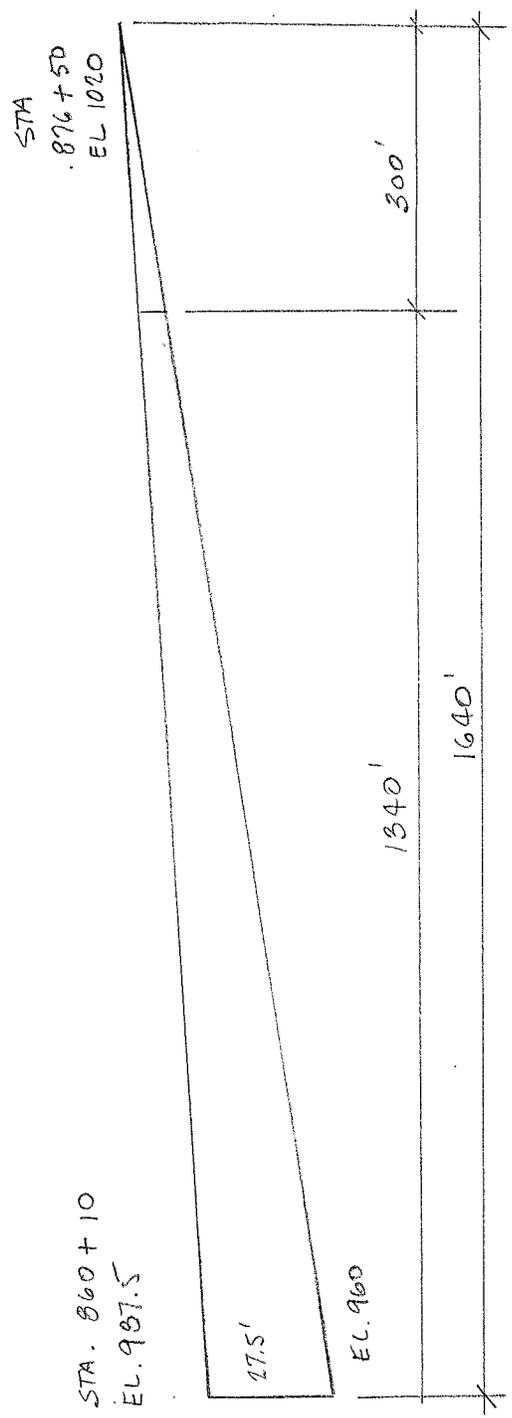
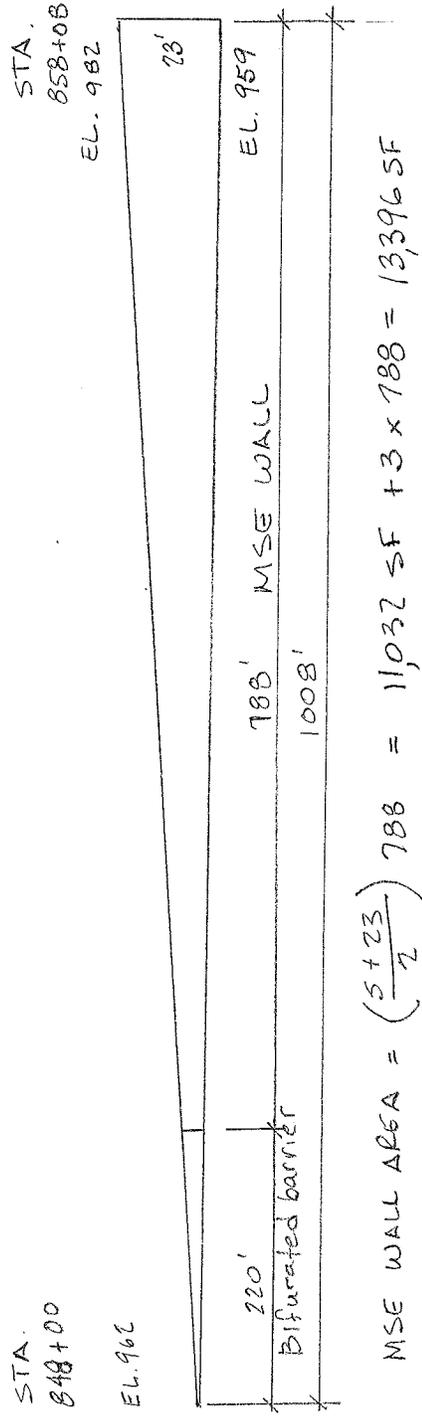
DRAWING No.  
**23-248**

PROJECT: **I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD FOR HOV LANES**  
 NH000-0073-03(242), P.I. No. 714130  
 Cobb County, GA

ALTERNATIVE NO.:  
 W-1

ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: 11 of 12



MSE WALL AREA =  $\left(\frac{5+27.5}{2}\right) 1340' = 21,775 + 3 \times 1340 = 25,795 \text{ SF}$

ADD'L EXCAVATION

$23 \times 529 \text{ ft}^2 \times 1008 / (2 \times 27) = 9875 \text{ cu yd}$

$27.5 \times 756 \text{ ft}^2 \times 1640 / (2 \times 27) = 22,960 \text{ cu yd}$

32,835 cu yd



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

ALTERNATIVE NO.:  
**W-2**

DESCRIPTION: **ADJUST THE REVERSIBLE LANE PROFILE BETWEEN  
 SOUTH MARIETTA PARKWAY AND BANBERRY ROAD TO  
 REDUCE THE EXTENT OF THE RETAINING WALLS**

SHEET NO.: 1 of 5

**ORIGINAL DESIGN:** (sketch attached)

The current managed lane road profile between Sta 469+00 to 489+00 requires mechanically stabilized embankment (MSE) retaining walls that are 20 ft. to 30 ft. in height.

**ALTERNATIVE:** (sketch attached)

Lower the roadway profile between Sta 469+00 to 489+00 to lower the MSE wall height.

**ADVANTAGES:**

- Reduces wall material requirements
- Reduces construction time

**DISADVANTAGES:**

- Provides a slightly steeper roadway grade but meets proper design criteria

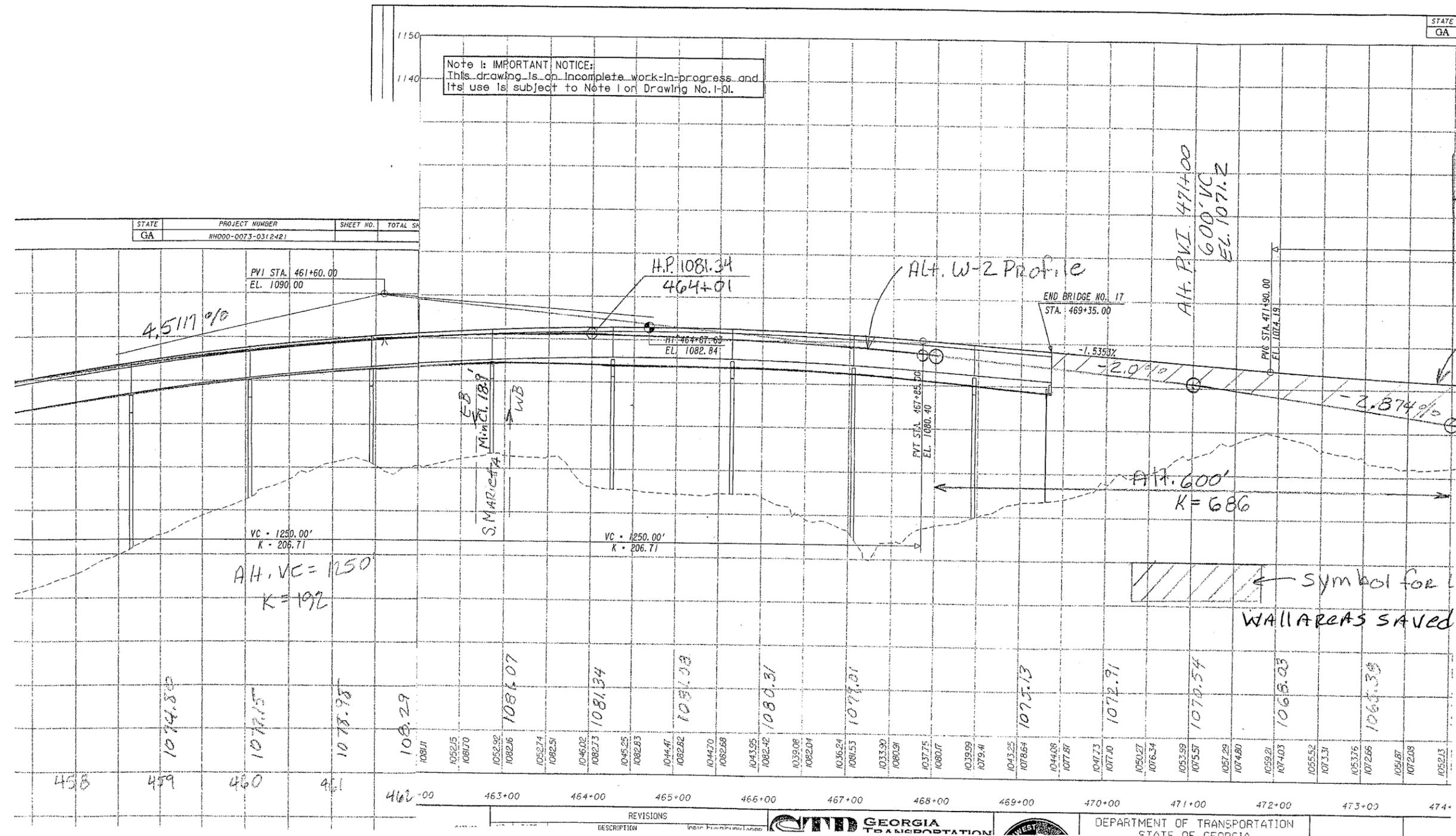
**DISCUSSION:**

The roadway profile between Sta 469+00 to 489+00 is in a high fill area that requires MSE retaining walls which are between 20 ft. and 30 ft. high. It is possible to lower this profile by as much as 3 to 13 feet to save wall construction requirements. There would also be a slight savings in earthwork embankment for areas behind the wall's special backfill. The reduced amount of MSE walls would save future maintenance requirements.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,298,000	—	\$ 2,298,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 2,298,000	—	\$ 2,298,000

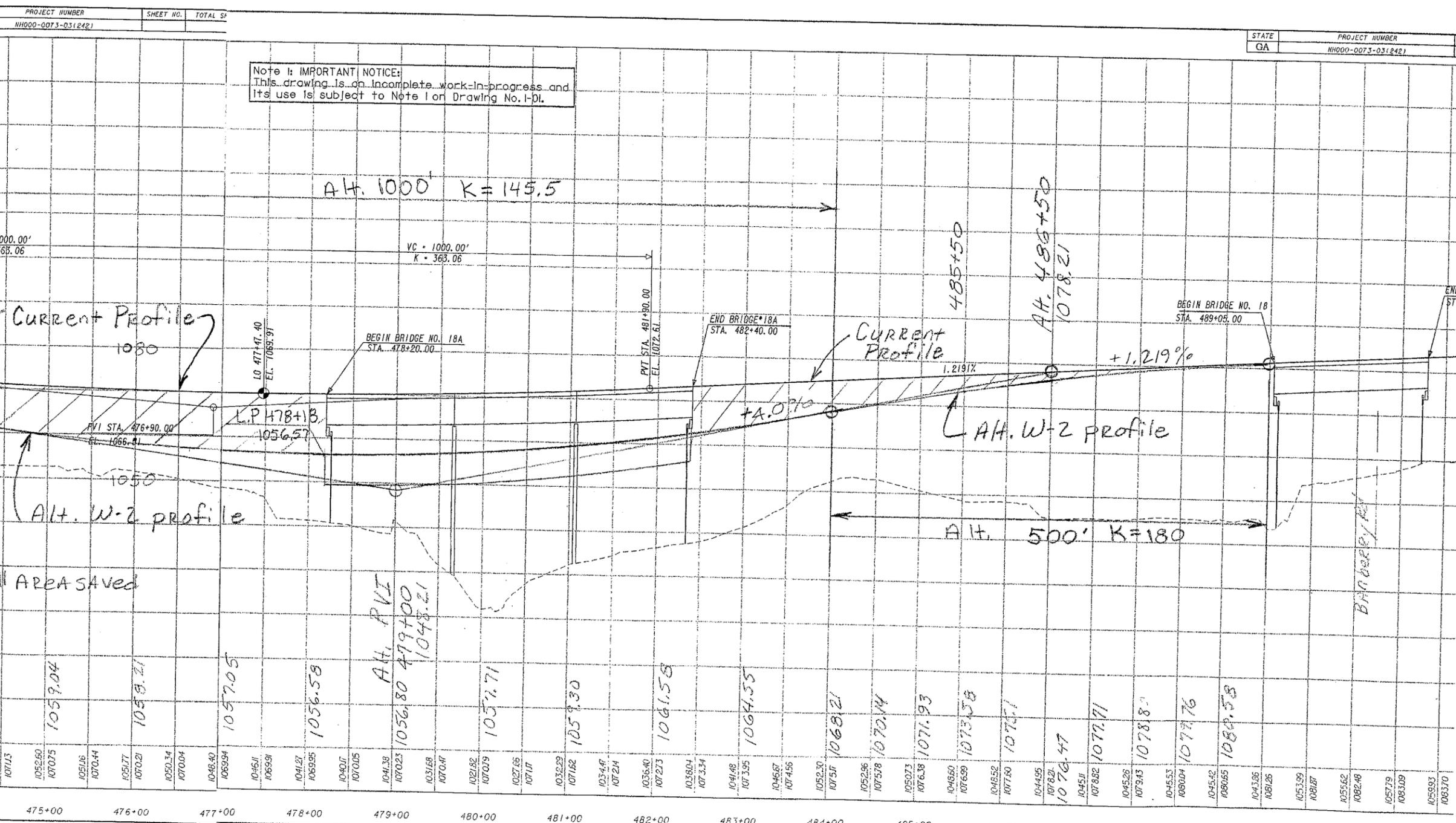
"Original" &  
Alternate Profiles

Sketch  
Alt. W-2  
2/5



# "Original" & Alternate Profiles

Sketch  
Alt. W-2  
315



NO	DATE	DESCRIPTION	DRG	CHKR	SUPV	APPR

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**W-2**

SHEET NO.: 4 of 5

## Original Costs Saved:

MSE retaining wall area saved:

Sta 469+35 – 474+00 = 465 ft. at average wall height of 5 ft

Sta 474+00 – 478+20 = 420 ft at average wall height of 10.5 ft

Sta 484+00 – 489+00 = 500 ft. at average wall height of 2.5 ft

Longitudinal Wall areas saved =  $[(465' \times 5') + (420' \times 10.5') + (500' \times 2.5')] \times 2 \text{ sides} = 15,970 \text{ SF}$

End Wall areas saved =  $[(3.5' \text{ ht} \times 50' \text{ wide}) + (13' \text{ ht} \times 50' \text{ wide}) + (11' \text{ ht} \times 50' \text{ wide})] = 1,375 \text{ SF}$

Total Area saved = 17,345 SF

There would also be approximately 9,000 CY earthwork embankment saved that is for the area behind the MSE wall's special embankment.



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**W-3**

DESCRIPTION: **ADJUST THE REVERSIBLE LANE PROFILE FROM STA 406+70 TO STA 418+55 TO REDUCE MECHANICALLY STABILIZED EMBANKMENT WALLS**

SHEET NO.: 1 of 6

**ORIGINAL DESIGN:** (sketch attached)

The managed lanes roadway profile from Sta 406+70 to Sta 418+55 has approximately 25 ft. to 30 ft. high mechanically stabilized embankment (MSE) retaining walls.

**ALTERNATIVE:** (sketch attached)

Lower the roadway profile 10 ft. from Sta 396+00 to Sta 439+00 to reduce the area of MSE retaining wall.

**ADVANTAGES:**

- Reduces MSE wall material requirements
- Reduces construction time
- Reduces future wall maintenance requirements

**DISADVANTAGES:**

- None apparent

**DISCUSSION:**

The roadway design has MSE roadway fill walls that are 25 ft. to 30 ft. high from Sta 406+70 to Sta 418+55. The alternate design lowers the profile by approximately 10 ft. resulting in a profile grade that is parallel to existing I-75 and meets the design speed requirement. There would also be a slight savings in earthwork embankment for the areas behind the walls' special backfill. The reduced amount of MSE walls saves future maintenance requirements.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,276,000	—	\$ 3,276,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 3,276,000	—	\$ 3,276,000

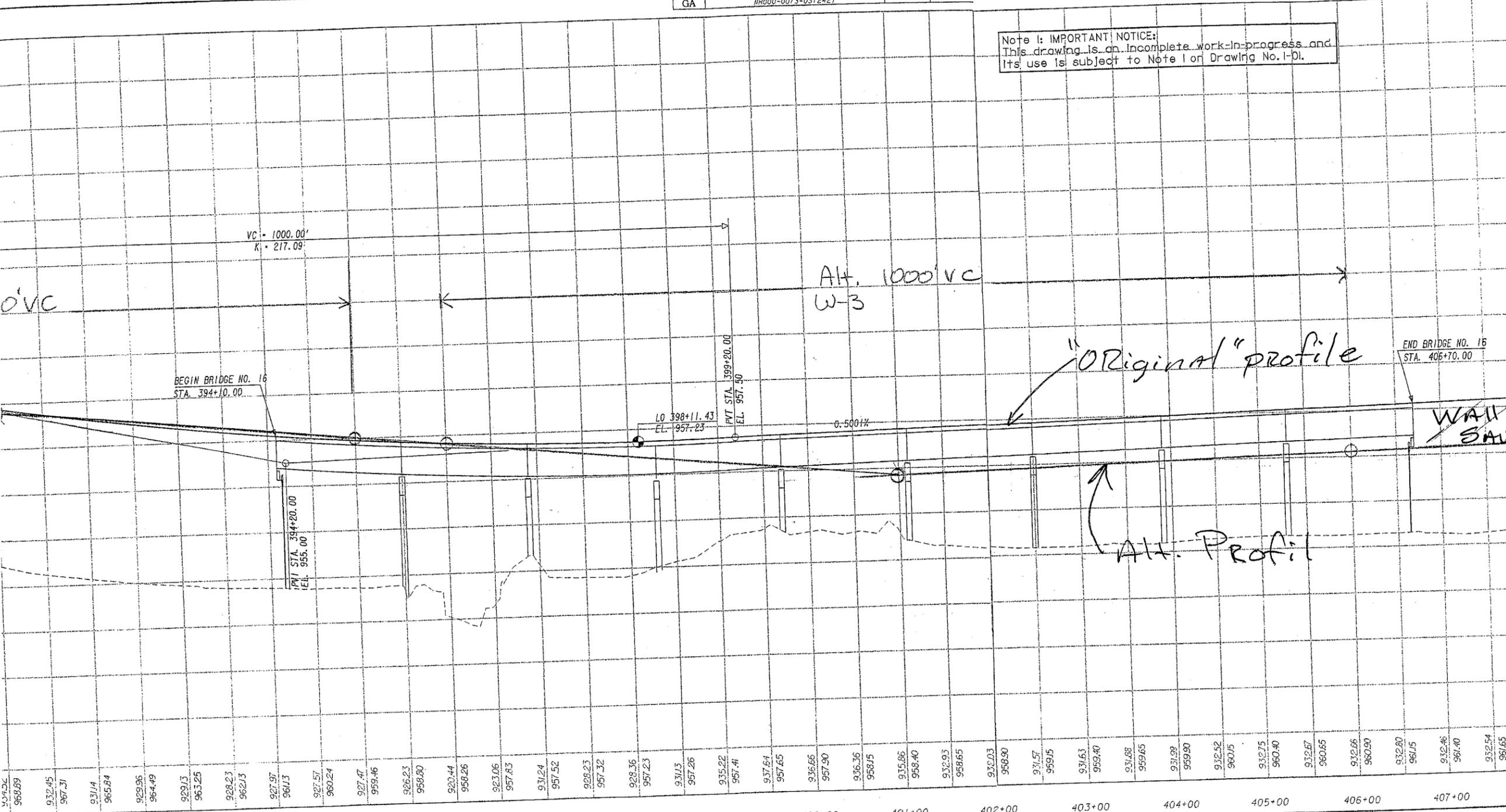
# "Original" & Alternate Profiles

Sketch  
Alt. W-3

sht. 2/6

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SH
GA	HH000-0073-031(242)		

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



"Original" profile

Alt. Profile

WALL AREA SAVED

968.89	932.45	967.31	931.14	965.84	929.96	964.49	929.13	963.26	928.23	962.13	927.97	961.13	927.57	960.24	927.47	959.46	926.23	958.80	920.44	958.26	923.06	957.83	931.24	957.52	928.23	957.32	928.36	957.23	931.13	957.26	935.22	957.41	937.64	957.65	936.66	957.90	936.36	958.15	935.86	958.40	932.93	958.65	932.03	958.90	931.57	959.15	931.63	959.40	931.88	959.65	931.39	959.90	932.52	960.15	932.75	960.40	932.67	960.65	932.66	960.90	932.80	961.15	932.46	961.40	932.54	961.65
391+00	392+00	393+00	394+00	395+00	396+00	397+00	398+00	399+00	400+00	401+00	402+00	403+00	404+00	405+00	406+00	407+00																																																		

**GEORGIA TRANSPORTATION PARTNERS**  
**DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA**

1-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PROFILE

REVISIONS			
NO	DATE	DESCRIPTION	ORIG
A	6/30/08	PROGRESS DRAWINGS (ROLL PLOTS)	CEC
B	9/15/08	50% SUBMITTAL	CEC
C	11/30/08	PLOTTED PER ODOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC

**GEO TRAN PART**  
 SCALE: H = 50' H  
 V = 10' V

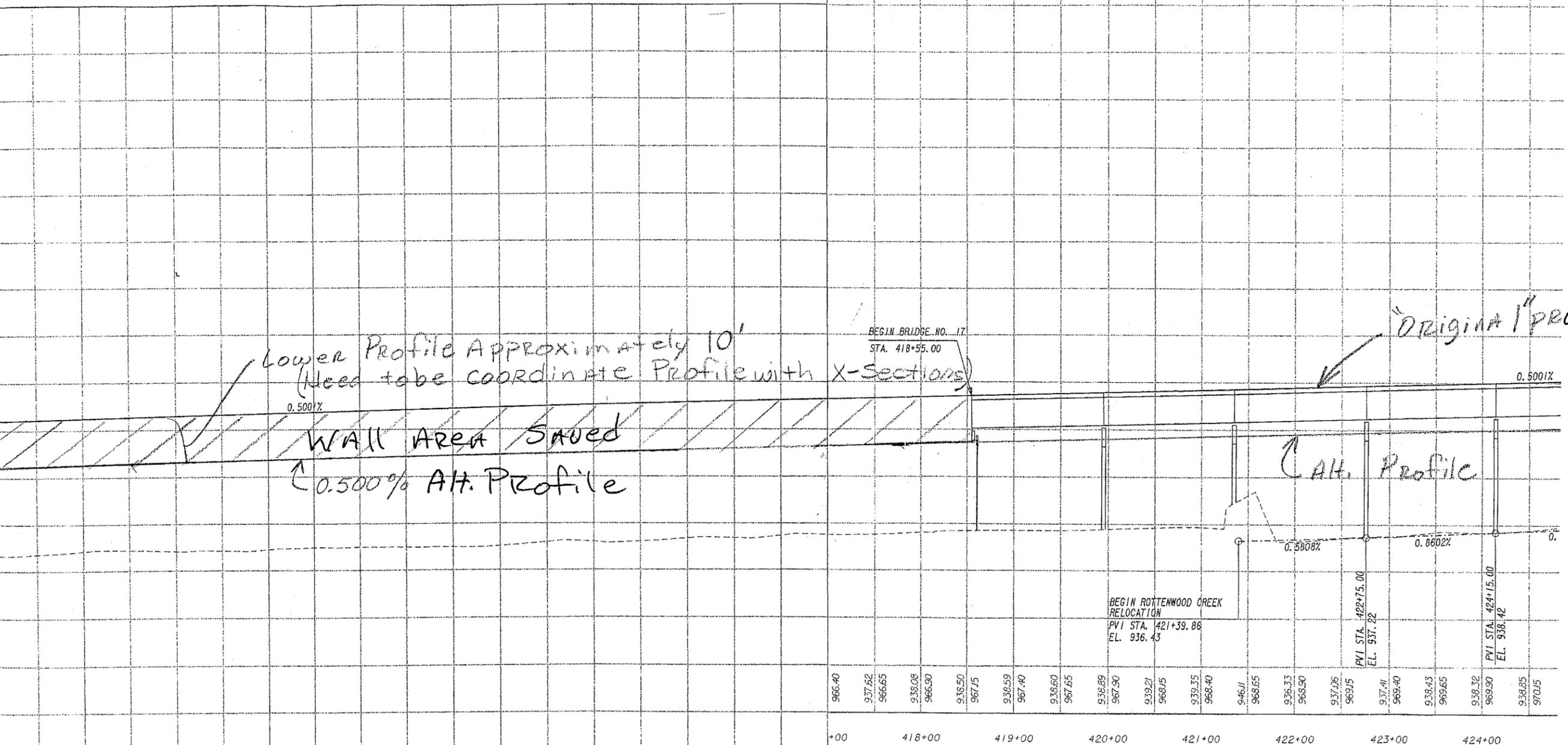
# "Original" & Alternate Profiles

Sketch  
Alt. W-3

Sht. 3/6

This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-DI.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SH.
GA	NH000-0073-03(242)		



961.90	933.60	962.15	934.22	962.40	934.45	962.55	934.14	962.50	934.22	963.15	934.48	963.40	934.87	963.65	934.93	963.90	934.96	964.15	934.96	964.40	935.17	964.65	935.98	964.90	936.05	965.15	936.11	965.40	936.77	965.65	936.82	965.90	937.36	966.15	937.54
+00	409+00	410+00	411+00	412+00	413+00	414+00	415+00	416+00	417																										

NO.		DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09		PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RRM
B	9/25/09		50% SUBMITTAL	CEC	PCT	MRM	RRM
C	8/30/09		PLOTTED PER GOVT'S TERMINATION FOR CONVENIENCE DIRECTOR	CEC			

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ.  
1" = 10' VERT.

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&J**

1-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

15

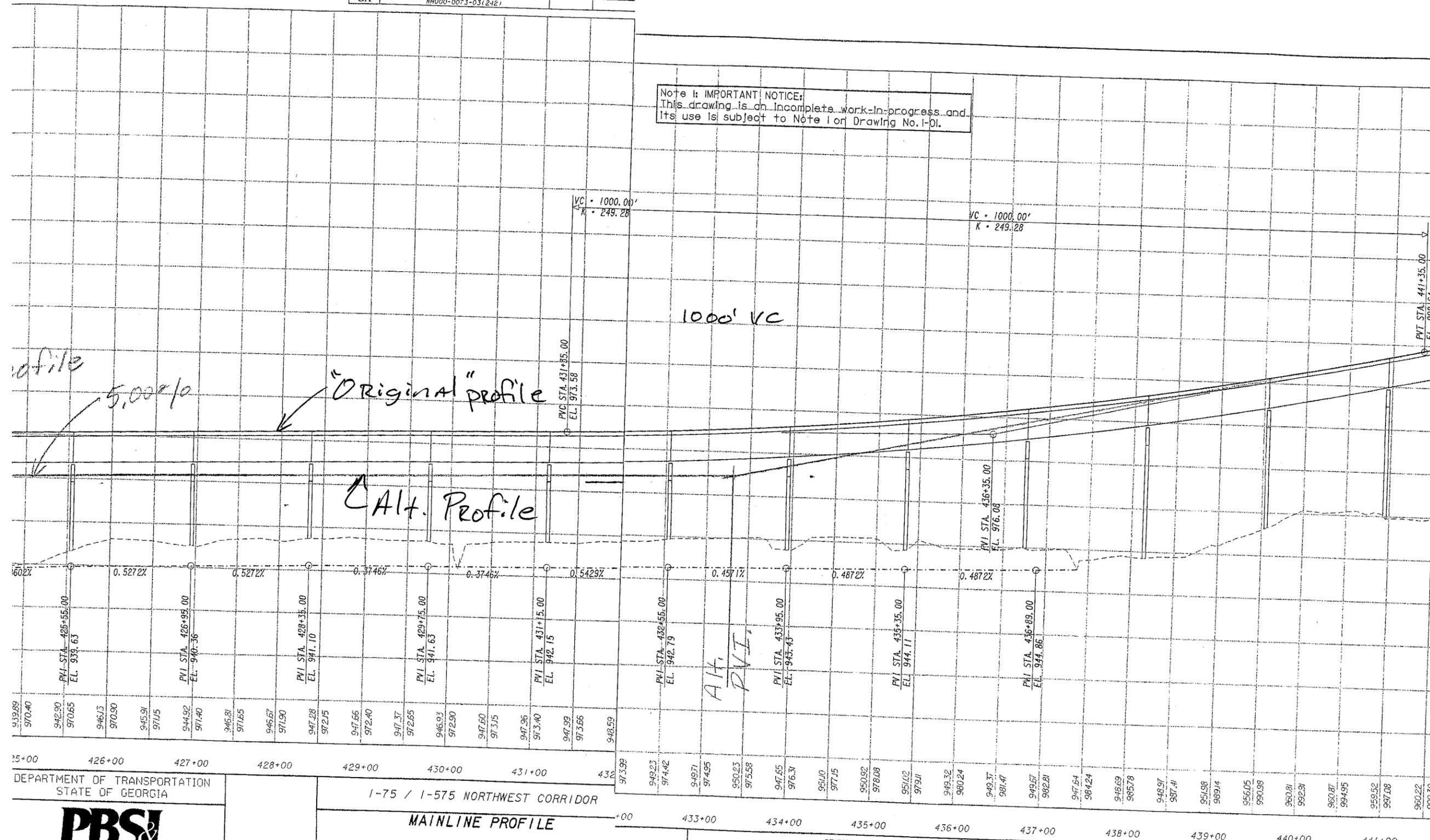
# "Original" & Alternate Profiles

Sketch  
Alt. W-3

Sheet 4/6

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SH.
GA	NH000-0073-03(242)		

Note: IMPORTANT NOTICE:  
This drawing is an Incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

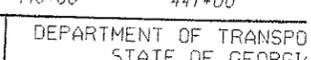
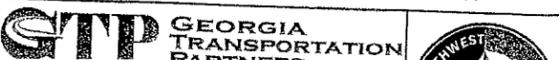


I-75 / I-75 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

NO.	DATE	DESCRIPTION	ORIG.	CHKR.	SUPV.	APPR.
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MHW	RMK
R	8/25/09					



# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**W-3**

SHEET NO.: **5 of 6**

MSE Wall area saved by lowering profile by 10 ft:  
Sta 406+70 to Sta 418+55

Longitudinal Wall area saved =  $(1,185' \times 10' \times 2 \text{ sides}) = 23,700 \text{ SF}$   
End walls area saved =  $50' \times 10' \times 2 \text{ ends} = \underline{1,000 \text{ SF}}$   
Total area saved =  $24,700 \text{ SF}$

Earthwork embankment saved that is outside the wall's special embankment = 13,000 CY



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**575-1**

DESCRIPTION: **MOVE SLIP RAMP (HOT LANE) AT HAWKINS STORE ROAD TO THE NORTH AND OFF OF THE BRIDGE OVER HAWKINS STORE ROAD**

SHEET NO.: **1 of 6**

**ORIGINAL DESIGN:** (sketch attached)

The current design has the slip ramp for the I-575 Managed Lane in the area of Hawkins Store Road running across the I-575 bridge over Hawkins Store Road.

**ALTERNATIVE:** (sketch attached)

Shift the Managed Lane slip ramp in the area of Hawkins Store Road to the north and end the slip ramp ahead of the I-575 bridge over Hawkins Store Road. This moves the slip ramp off of the bridge and reduces the bridge width.

**ADVANTAGES:**

- Reduces bridge construction material requirements with the narrower bridge
- Reduces bridge maintenance
- Reduces bridge construction time

**DISADVANTAGES:**

- None apparent

**DISCUSSION:**

The current design places the HOT slip ramp in an area that requires additional widening to the I-575 bridge over Hawkins Store Road. The Alternate design would shift the slip ramp to the north approximate 700 ft. and therefore would move the slip ramp off of the I-575 bridge reducing the required bridge widening. There is sufficient length to shift the slip ramp to the north without any additional construction labor and material requirements.

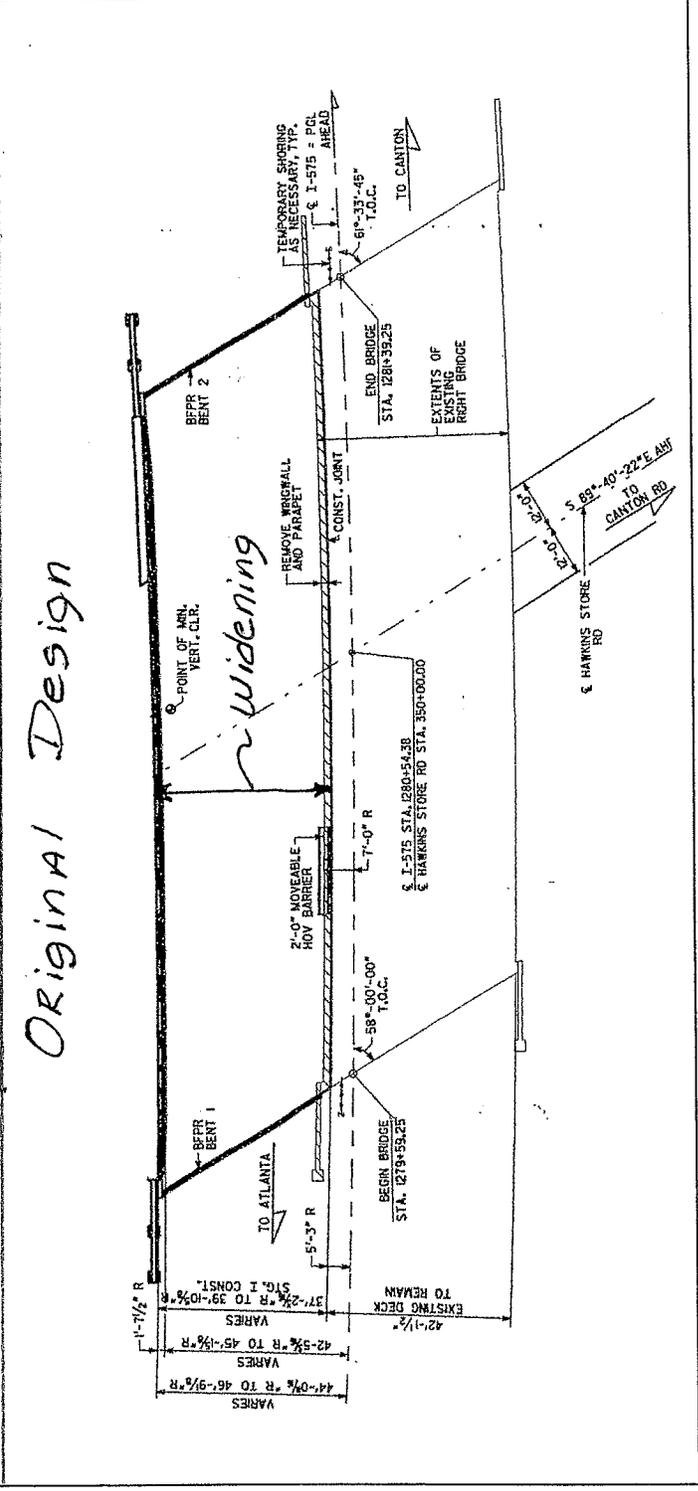
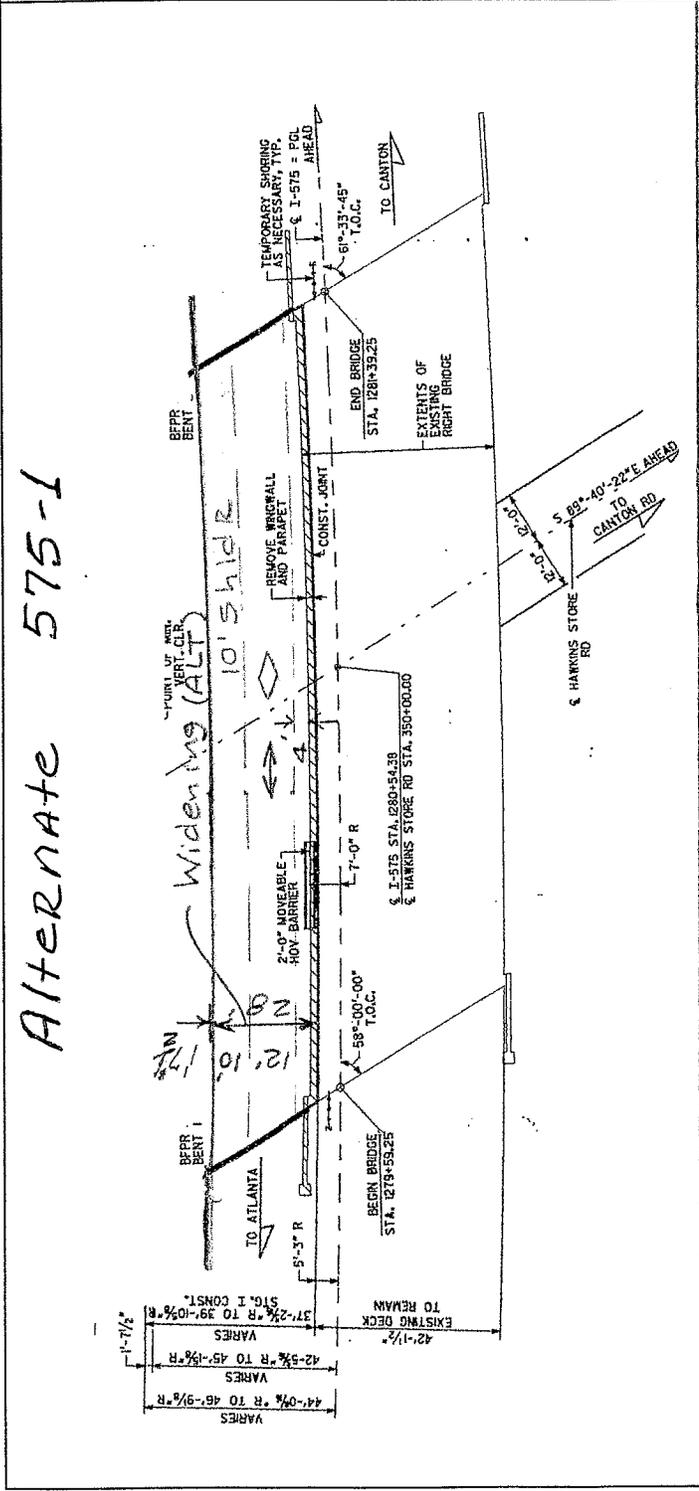
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN (for add'l bridge width)	\$ 567,000	—	\$ 567,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 567,000	—	\$ 567,000

PROJECT: **I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD FOR HOV LANES**  
 NH000-0073-03(242), P.I. No. 714130  
 Cobb County, GA

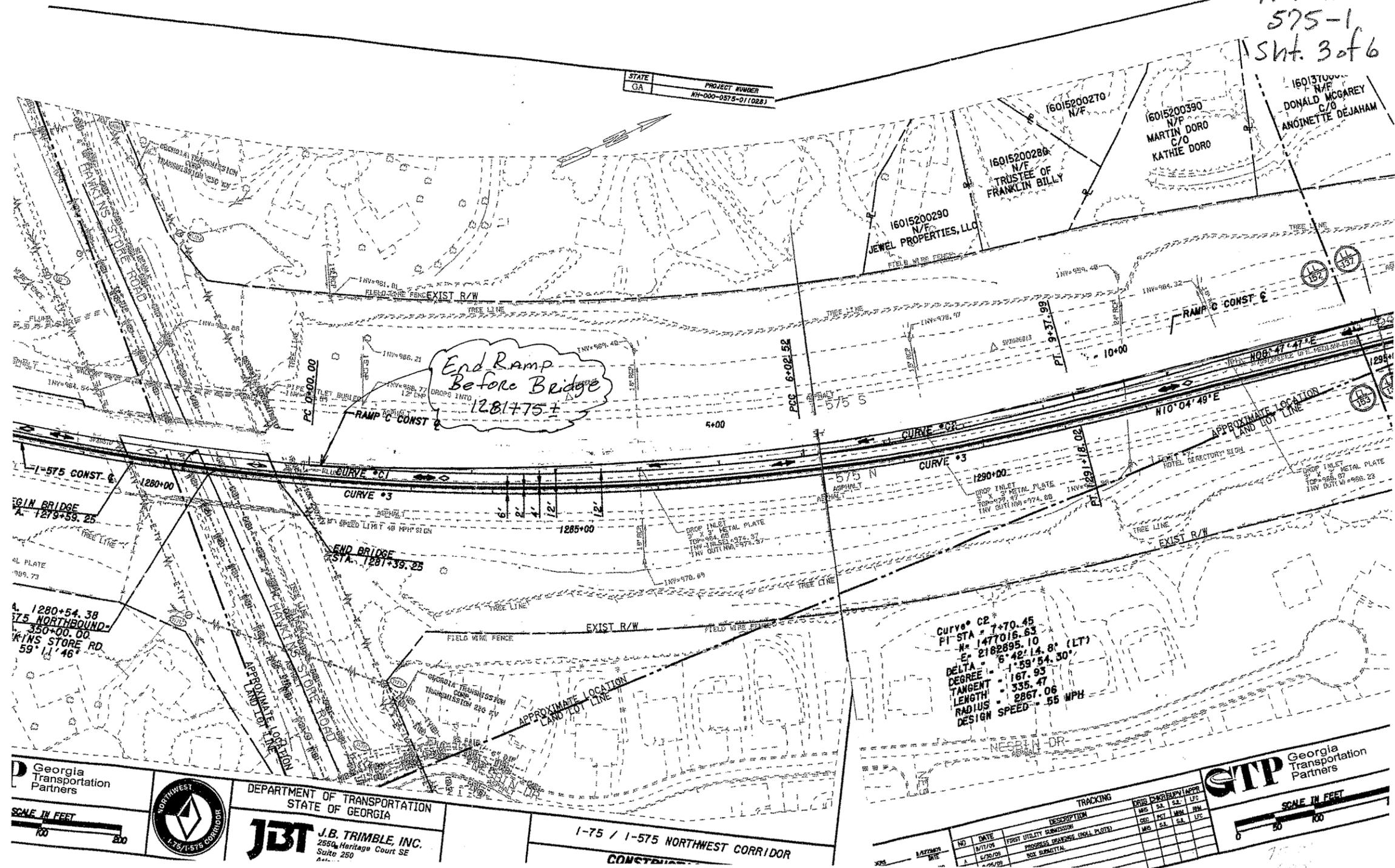
ALTERNATIVE NO.: **575-1**

ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: **2** of **6**



ALT. NO.  
575-1  
Sht. 3 of 6



Georgia Transportation Partners  
SCALE IN FEET  
0 50 100



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
**JBT** J.B. TRIMBLE, INC.  
2550 Heritage Court SE  
Suite 250

1-75 / 1-575 NORTHWEST CORRIDOR  
CONST.

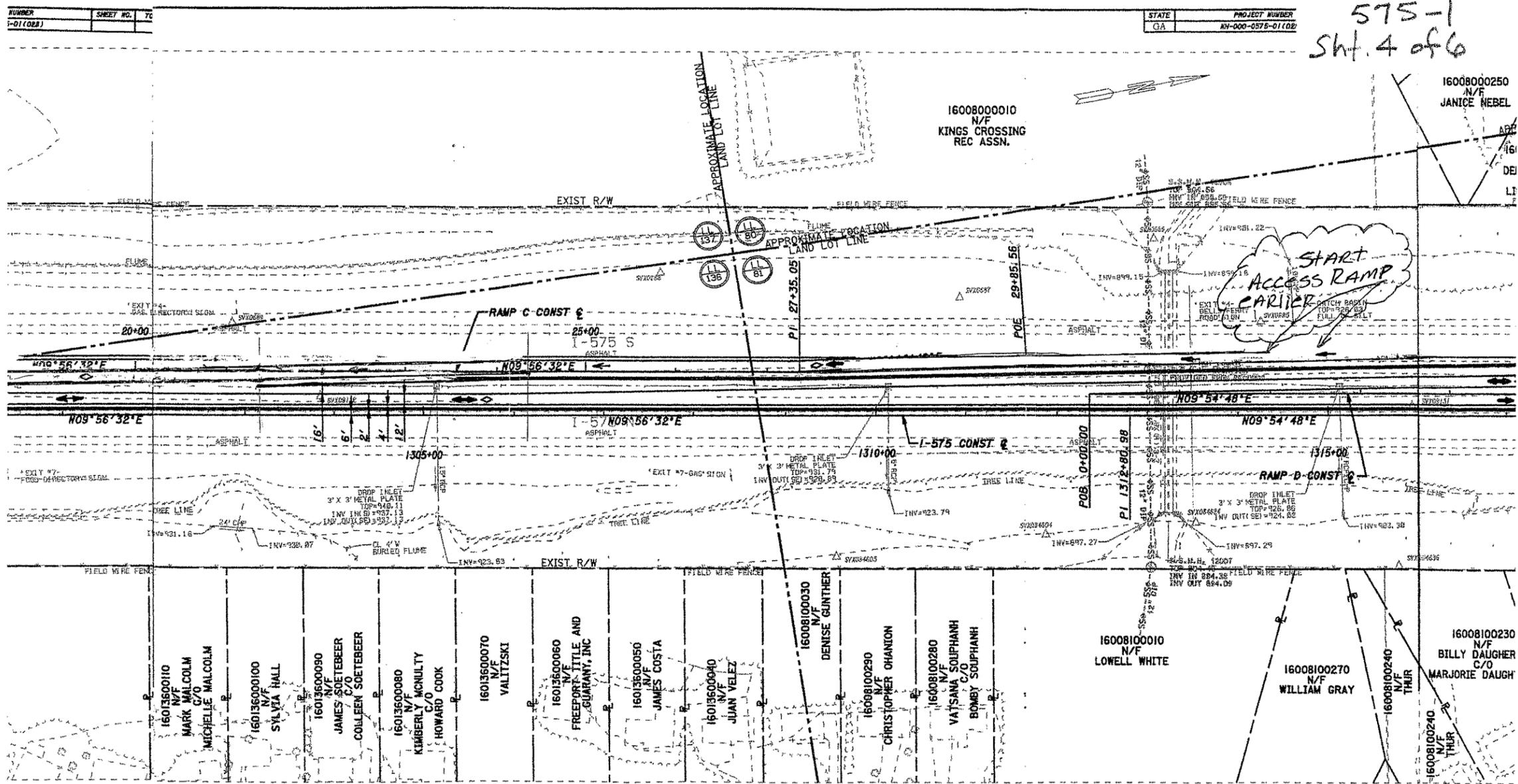
NO.	DATE	DESCRIPTION	TRACKING			
			DESIGN	CONSTRUCTION	ASPH	UTL
1	6/21/09	PROGRESS DRAWINGS (FINAL PLOTTED)				
2	6/25/09	NOI SUBMITTAL				

SCALE IN FEET  
0 50 100

Alt. 575-1

Sketch

ALT. NO.  
575-1  
Sht. 4 of 6



NORTHWEST CORRIDOR  
CONSTRUCTION PLAN

TRACKING				
NO	DATE	DESCRIPTION	DRG	CHKR/APPV
1	8/17/09	FIRST UTILITY SUBMISSION	MS	SL S.L. LFC
2	8/20/09	PROGRESS DRAWINGS (NO. 1 PLOTS)	CE	ECT MSW RRM
3	8/25/09	BOX SUBMITTAL	MS	SL S.L. LFC
4	9/23/09			
5	9/23/09			

**GTP** Georgia Transportation Partners

SCALE IN FEET  
0 50 100 200



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
2550 Heritage Court SE  
Suite 250  
Atlanta, Georgia 30339

I-75 / I-575 NORTHWEST CORRIDOR  
CONSTRUCTION PLAN

I-575 REVERSIBLE

NO	DATE
A	8/17/09
B	8/20/09
C	8/25/09
D	9/23/09

Alt. 575-1 Sketch

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**575-1**

SHEET NO.: **5 of 6**

Average Bridge additional width (I-575 over Hawkins Store Road) for Current/Original design = 38.583 ft  
Bridge additional width (I-575 over Hawkins Store Road) for Alternate design = 29.625 ft

Bridge Area saved with Alternate Design:

(Difference in required additional bridge widening): 38.583 ft (Original) – 29.625 ft (Alternate) = 8.958 ft

8.958 ft width x 180 ft length = 1,612.44 SF (Bridge area saved)



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**575-2**

DESCRIPTION: **END THE PROJECT JUST SOUTH OF THE LITTLE RIVER BRIDGE BY SHIFTING THE SLIP RAMP TO THE SOUTH**

SHEET NO.: **1 of 7**

**ORIGINAL DESIGN:** (sketch attached)

The current design has the project ending north of the Little River Bridge, which requires widening the northbound I-575 bridge for an extra lane.

**ALTERNATIVE:** (sketch attached)

Shift the northbound slip ramp to south of the I-575 bridge over Little River and end the project before the bridge.

**ADVANTAGES:**

- Reduces bridge construction cost
- Reduces construction time

**DISADVANTAGES:**

- The redesign of the slip may shorten it slightly

**DISCUSSION:**

The current design requires widening the northbound I-575 bridge over Little River an extra lane for the end of the slip ramp for the managed lane. Shifting the slip ramp and the emergency access point slightly to the south to end the slip ramp before the I-575 bridge saves costs and construction time by eliminating the 19.625-ft. bridge widening. Even though the slip ramp may be shorter, there is sufficient length to properly end the slip ramp before the bridge.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,642,000	—	\$ 3,642,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 3,642,000	—	\$ 3,642,000



PROJECT: I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD  
FOR HOV LANES  
NH000-0073-03(242), P.I. No. 714130  
Cobb County, GA

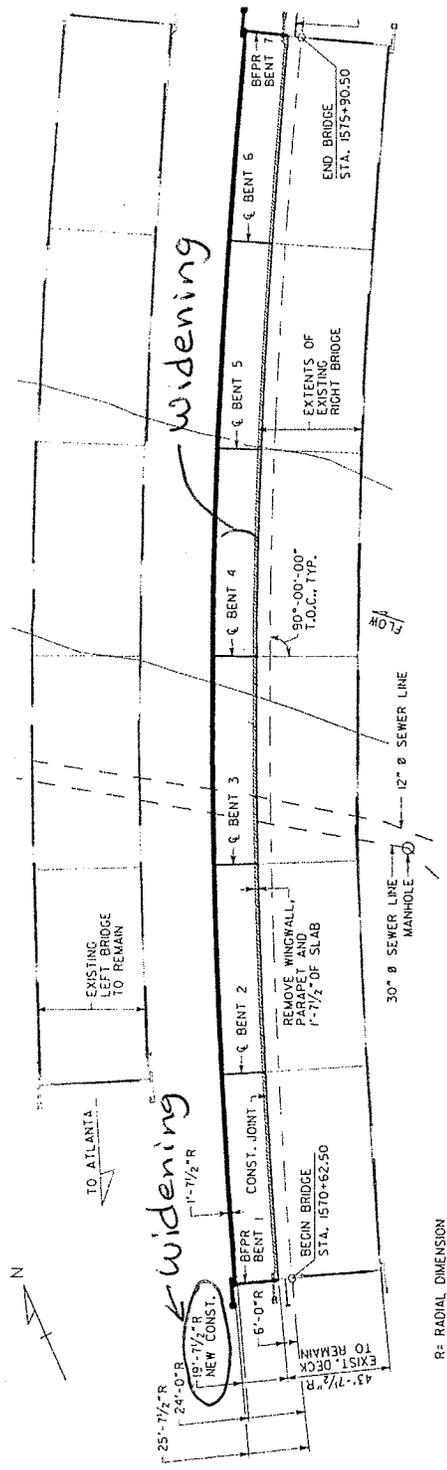
ALTERNATIVE NO.:

575-2

ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: 2 of 7

Original/Current Bridge Widening

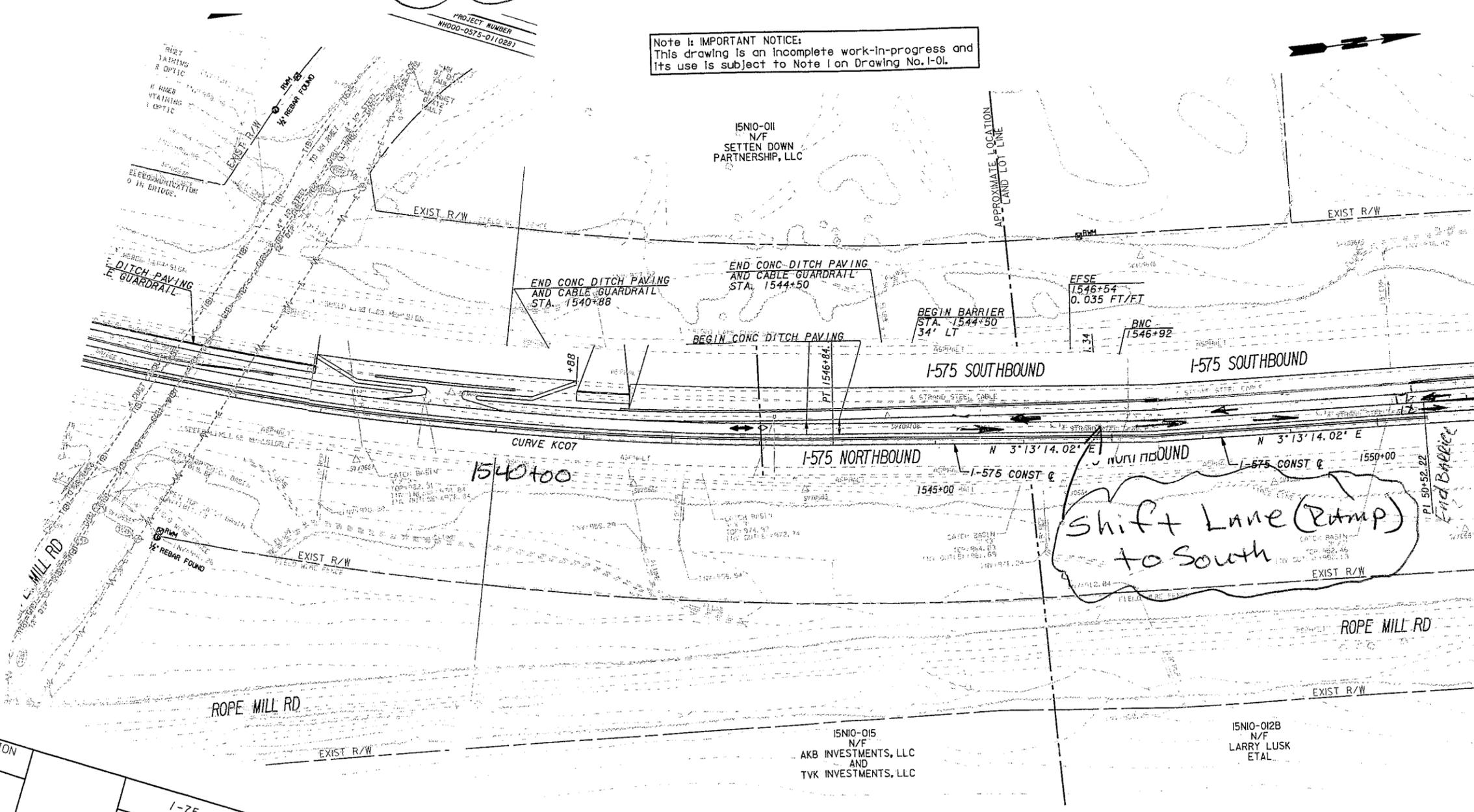


Sketch  
Alt. 575-2

Sh# 3/7

Alternate Design

Note: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. I-01.

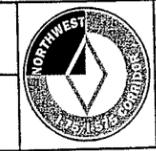


ION  
1-75 / I-575 NORTHWEST CORRIDOR  
**MAINLINE PLAN**  
I-575 REVERSIBLE MANAGED LANES  
DRAWING NO. 13-35

		REVISIONS			
NO	DATE	DESCRIPTION	DRG	CHK	APP
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	WS	SA	LFC
B	9/25/09	50% SUBMITTAL	WS	SA	LFC
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	WS	SA	LFC

**GTP** Georgia Transportation Partners

SCALE IN FEET  
0 50 100 200



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
2550 Heritage Court SE  
Suite 250  
Atlanta, Georgia 30339

Sketch  
 Alt. 575-2

Sheet 4/7

Alternate  
 Design

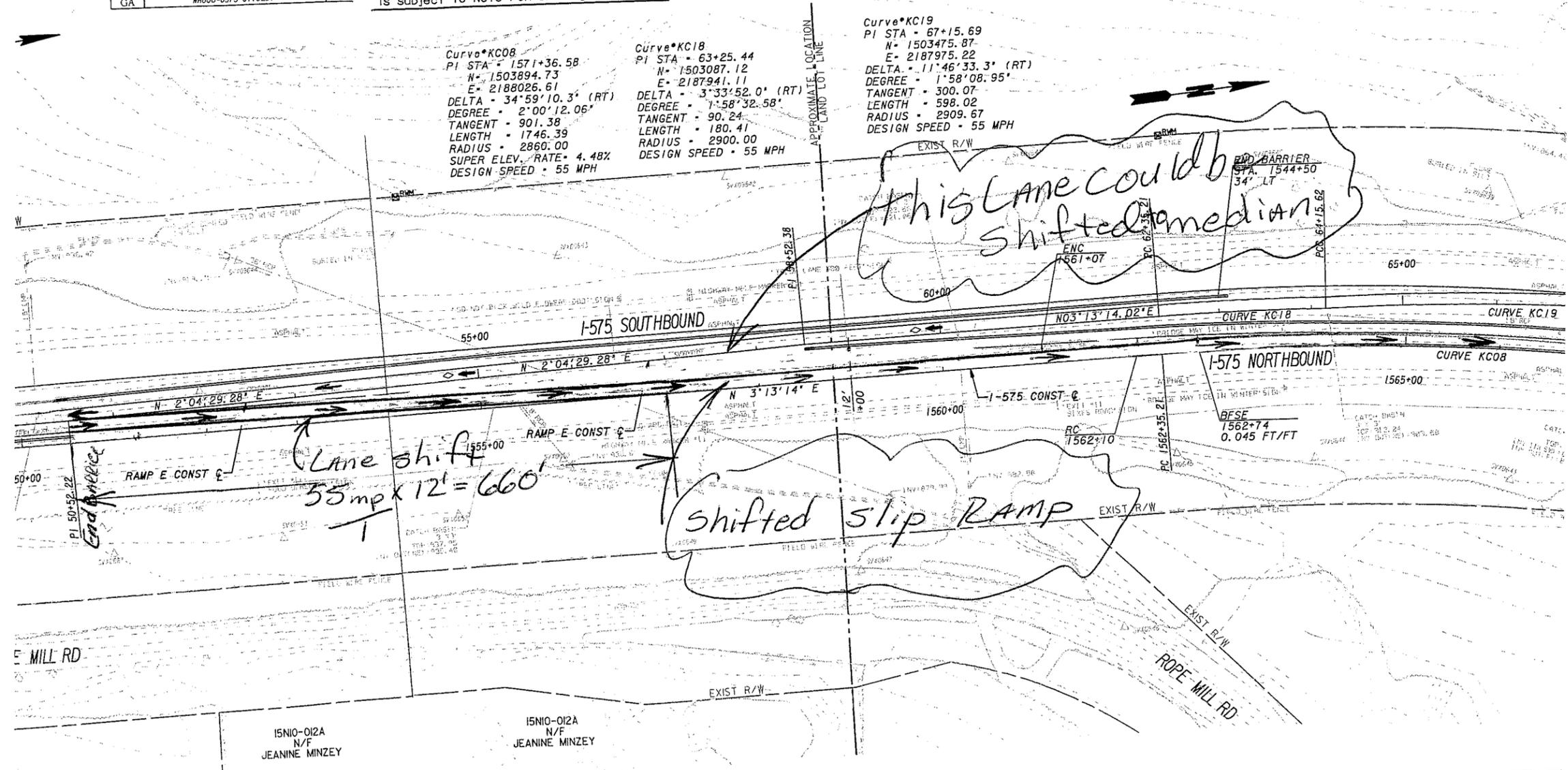
STATE	PROJECT NUMBER	SHEET
GA	NH000-0575-01(02B)	

IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 is subject to Note 1 on Drawing No. I-01.

Curve\*KC08  
 PI STA - 1571+36.58  
 N - 1503894.73  
 E - 2188026.61  
 DELTA - 34°59'10.3" (RT)  
 DEGREE - 2°00'12.06"  
 TANGENT - 901.38  
 LENGTH - 1746.39  
 RADIUS - 2860.00  
 SUPER ELEV. RATE - 4.48%  
 DESIGN SPEED - 55 MPH

Curve\*KC18  
 PI STA - 63+25.44  
 N - 1503087.12  
 E - 2187941.11  
 DELTA - 3°33'52.0" (RT)  
 DEGREE - 7°58'32.58"  
 TANGENT - 90.24  
 LENGTH - 180.41  
 RADIUS - 2900.00  
 DESIGN SPEED - 55 MPH

Curve\*KC19  
 PI STA - 67+15.69  
 N - 1503475.87  
 E - 2187975.22  
 DELTA - 11°46'33.3" (RT)  
 DEGREE - 1°58'08.95"  
 TANGENT - 300.07  
 LENGTH - 598.02  
 RADIUS - 2909.67  
 DESIGN SPEED - 55 MPH



This lane could be shifted to median

Shifted slip RAMP

Line shift  
 $55 \text{ mph} \times 12' = 660'$

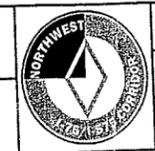
15N10-012A  
 N/F  
 JEANINE MINZEY

15N10-012A  
 N/F  
 JEANINE MINZEY

REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	APPR	APPD
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	WHS	SJK	SJK	LFC
B	9/25/09	SOX SUBMITTAL	WHS	SJK	SJK	LFC
C	11/30/09	PLOTTED PER CDD'S TERMINATION FOR CONVENIENCE DIRECTION	WHS	SJK	SJK	LFC

**GTP** Georgia Transportation Partners

SCALE IN FEET  
 0 50 100 200



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**JBT** J.B. TRIMBLE, INC.  
 2650 Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30339

I-75 / I-575  
**MAI**  
 I-575 REVERSIBLE

I-75 / I-575 NORTHWEST CORRIDOR  
**MAINLINE PLAN**  
 I-575 REVERSIBLE MANAGED LANES

Sketch  
 Alt. 575-2  
 5/17

Alternate Design

Eliminates Bridge Widening

55mph x 12' = 660'

End Lane (Ramp)  
 End project Alt. 575-2



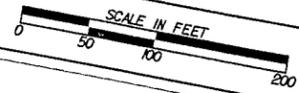
Note: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. I-01.

DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA  
**J.B. TRIMBLE, INC.**  
 2550 Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30335

1-75 / I-575 NORTH  
**MAINLINE**  
 I-575 REVERSIBLE MANAGEMENT

DESCRIPTION	REVISIONS			
	NO.	DATE	BY	APP.
ORIG. SUBMITTAL				
LOTTED PER CDD'S TERMINATION FOR				
REVISIONS				

**GTP** Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA  
**JBT** J.B. TRIMBLE, INC.  
 2550 Heritage Court SE  
 Suite 250  
 Atlanta, Georgia 30335

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**575-2**

SHEET NO.: **6 of 7**

The Current/Original design would require widening the existing I-575 bridge over Little River by 19.625 ft.  
The Alternate design would not require widening the bridge.

Bridge Area saved:  $19.625 \text{ ft} \times 528 \text{ ft} = 10,362 \text{ SF}$



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**P-1**

DESCRIPTION: **ON I-75 WHERE THERE ARE TWO MANAGED LANES, USE AN 11-FT.-WIDE LANE ADJACENT TO THE 10-FT.-WIDE SHOULDER**

SHEET NO.: 1 of 4

**ORIGINAL DESIGN:** (sketch attached)

Use 12-ft.-wide lanes throughout the project for all managed lanes.

**ALTERNATIVE:** (sketch attached)

On I-75 where there are two managed lanes, use an 11-ft.-wide lane in lieu of a 12-ft.-wide lane on the side of 10-ft.-wide shoulder.

**ADVANTAGES:**

- Reduces storm water runoff
- Reduces pavement maintenance
- Reduces amount of bridge area and maintenance
- Reduces cost

**DISADVANTAGES:**

- None apparent

**DISCUSSION:**

While driving on the 11-ft.-wide managed lanes, the 10 ft. shoulder width should mitigate any perceived loss of safety. Inside the perimeter, Metro Atlanta freeways have 11-ft.-wide lanes. Few problems have been reported.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 9,190,000	—	\$ 9,190,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 9,190,000	—	\$ 9,190,000

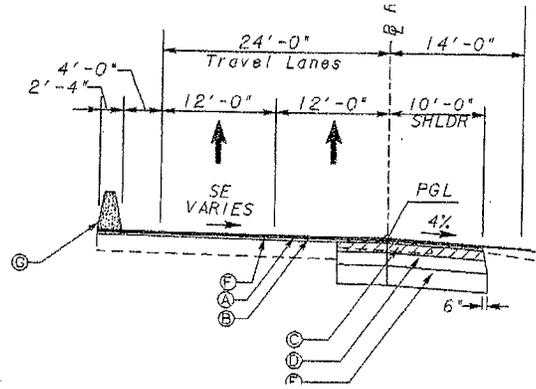
PROJECT: **I-75 FROM AKERS MILL ROAD TO BANBERRY ROAD  
FOR HOV LANES**  
NH000-0073-03(242), P.I. No. 714130  
Cobb County, GA

ALTERNATIVE NO.:  
**P-1**

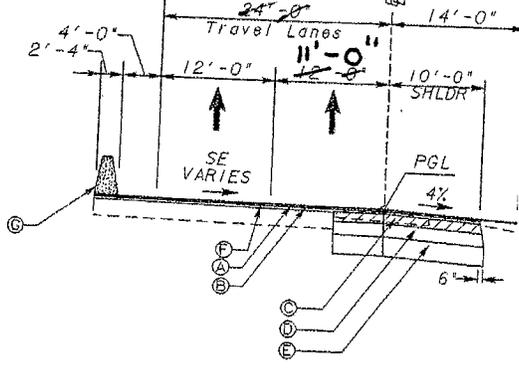
ORIGINAL DESIGN  ALTERNATIVE DESIGN  BOTH

SHEET NO.: **2 of 4**

ORIGINAL



**23'-0"**



ALTERNATE

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALT. NO.:

**P-1**

SHEET NO.: **3 of 4**

Since the width will decrease by one foot, the bridge and the road cost will decrease by one square foot for each increase of a foot in the length of the project. From the plans, following stations were extracted for bridge sections and the pavement sections.

Bridge:

234+95 to 261+00 = 2,605'  
270+00 to 300+60 = 3,060'  
312+20 to 315+60 = 340'  
325+85 to 328+65 = 280'  
352+90 to 383+10 = 3,020'  
395+50 to 406+70 = 1,120'  
418+55 to 469+35 = 5,080'  
513+20 to 571+90 = 5,870'  
624+50 to 675+30 = 5,080'  
684+30 to 699+70 = 1,540'  
703+27 to 714+57 = 1,130'  
Total = 29,125 feet

Road:

261+00 to 270+00 = 900'  
300+60 to 312+20 = 1,160'  
315+60 to 325+85 = 1,025'  
328+65 to 352+90 = 2,425'  
383+10 to 395+50 = 1,240'  
406+70 to 418+55 = 1,185'  
469+35 to 513+20 = 4,385'  
571+90 to 624+50 = 5,260'  
675+30 to 684+30 = 900'  
699+70 to 703+27 = 357'  
714+57 to 723+00 = 843'  
Total = 19,680 feet

This implies that if the lane width is decreased by one foot, then 29,125 square feet of bridge pavement area and 19,680 square feet (2,187 square yard) of road pavement area can be saved.

The average cost of bridge is derived by dividing the total cost of bridge with the area of all bridges from station 234+95 to station 714+57. 
$$\frac{(\$209,138,654 + \$17,917,190 + \$15,937,978 + \$13,840,403 + \$4,026,698)}{(739,000 + 66,000 + 42,000 + 41,000 + 9,000) \text{ SF}}$$
$$= \$290.81/\text{SF}$$

Calculations for the mainline Pavement Section Unit Cost (\$/SY):

12" Plain Jointed Concrete Pavement: = \$112.00 / SY  
3" Asphaltic Concrete: 330#/SY x TN/2000# x \$95/TN = \$ 15.68 / SY  
12" G.A.B. = \$ 40.00 / SY  
Total = \$167.68 / SY



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**P-3**

DESCRIPTION: **UNDERNEATH THE CONCRETE PAVEMENT USE 3 IN. OF SOIL-CEMENT BASE IN LIEU OF ASPHALTIC CONCRETE BASE THE LENGTH OF THE PROJECT**

SHEET NO.: **1 of 3**

**ORIGINAL DESIGN:**

Use 3-in.-thick asphaltic concrete base under the 12-in.-thick concrete pavement throughout the project.

**ALTERNATIVE:** (sketch attached)

Use a 3-in.-thick soil-cement base in lieu of the 3-in.-thick asphaltic concrete base under the 12-in.-thick concrete pavement throughout the project.

**ADVANTAGES:**

- Saves significant material and labor requirements
- Saves construction time

**DISADVANTAGES:**

- Structural Number (SN) decreases
- Dust control may be required

**DISCUSSION:**

Section 2.5.3 of GDOT's Pavement Design Manual on Asphaltic Inter-layers says "The use of asphaltic material for base is not typical in the design and construction of today's rigid pavements." It then gives reasons for installing such a material, the chief ones being the function of a separator layer for subgrade fines from the PCC pavement and acting as a drainage layer for surface moisture infiltration. These functions can also be achieved by installing a soil-cement base. The 3-in.-thick asphaltic concrete base course should only be provided if it is required to achieve the necessary SN, otherwise significant amount of material and labor can be saved by switching to the soil-cement base.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 10,192,000	—	\$ 10,192,000
ALTERNATIVE	\$ 1,625,000	—	\$ 1,625,000
SAVINGS (Original minus Alternative)	\$ 8,567,000	—	\$ 8,567,000

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130*  
*Cobb County, GA*

ALT. NO.:

**P-3**

SHEET NO.: **2 of 3**

3 in. Asphaltic Concrete Base:  $330\#/SY \times TN/2000\# \times \$95/TN = \$15.68/sy$

3 in. Soil-Cement Base: \$2.50/sy

Total Quantity: 625,000 sy



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No.  
 713640  
 Cobb and Cherokee Counties, GA

ALTERNATIVE NO.:  
**P-4**

DESCRIPTION: **UNDERNEATH THE CONCRETE PAVEMENT, DELETE  
 THE 3-IN.-THICK ASPHALTIC CONCRETE BASE  
 THROUGHOUT THE PROJECT**

SHEET NO.: **1 of 3**

**ORIGINAL DESIGN:**

Use a 3-in.-thick asphaltic concrete base under the 12 in. concrete pavement throughout the project.

**ALTERNATIVE:** (sketch attached)

Do not put the asphaltic concrete base under the 12 in. concrete pavement throughout the project.

**ADVANTAGES:**

- Saves significant material and labor
- Saves construction time

**DISADVANTAGES:**

- Structural Number (SN) decreases
- There is no separator layer for surface moisture infiltration and for the subgrade fines to enter the PCC pavement
- It is rough to drive over 12 in. graded aggregate base during construction staging

**DISCUSSION:**

Section 2.5.3 of GDOT's Pavement Design Manual on Asphaltic Inter-layers says "The use of asphaltic material for base is not typical in the design and construction of today's rigid pavements." Although it gives reasons for installing such a material, none of them pertain to achieving SN. If the asphaltic layer is unnecessary to achieve the required SN, a significant amount of material and labor can be saved by eliminating it. Most of the time, concrete pavement is laid out over graded aggregate base. If a separation is required, it can be cheaply achieved by the use of geogrids at a cost of \$3-\$4 per square yard.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 10,192,000	—	\$ 10,192,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 10,192,000	—	\$ 10,192,000

# CALCULATIONS

PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130*  
*Cobb County, GA*

ALT. NO.:

**P-4**

SHEET NO.: **2 of 3**

3 in. Asphaltic Concrete Base:  $330\#/SY \times TN/2000\# \times \$95/TN = \$15.68/sy$

Total Quantity: 625,000 sy





# VALUE ENGINEERING ALTERNATIVE



PROJECT: <b>I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES</b> <i>NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640</i> <i>Cobb and Cherokee Counties, GA</i>	ALTERNATIVE NO.: <b>G-2</b>
DESCRIPTION: <b>WHERE POSSIBLE PROVIDE A 4-FT.-WIDE SHOULDER AND A 12-FT.-WIDE LANE IN LIEU OF TWO, 10-FT.-WIDE SHOULDERS</b>	SHEET NO.: <b>1 of 1</b>

**ORIGINAL DESIGN:** (sketch attached)

The standard design for the managed lanes has a 12-ft.-wide travel lane with two, 10-ft.-wide shoulders in some areas.

**ALTERNATIVE:** (sketch attached)

Where possible, use a 12-ft.-wide lane with a 12-ft.-wide shoulder on one side and a 4-ft.-wide shoulder on the other side.

**ADVANTAGES:**

- Provides a full lane for vehicles to pull off to if necessary
- Reduces the amount of pavement and bridges to construct by 4 ft.
- Reduces bridge and pavement maintenance

**DISADVANTAGES:**

- The distressed vehicle shoulder is only on one side of the road

**DISCUSSION:**

This alternative seeks to provide a full-width breakdown area in lieu of two narrow breakdown areas to enhance safety. It also will save material and labor by narrowing the constructed roadway.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE			
SAVINGS (Original minus Alternative)			
	<b>DESIGN SUGGESTION</b>		

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**G-3**

DESCRIPTION: **FROM THE MERGE POINT OF RAMP C AND THE TWO  
 MANAGED LANES ON BRIDGE NO. 2A TO WHERE RAMP H  
 MERGES IN, PROVIDE A THREE-LANE SECTION THAT  
 REDUCES TO TWO LANES**

SHEET NO.: **1 of 5**

**ORIGINAL DESIGN:** (sketch attached)

In the night-time period, the two-lane section of I-75 managed lanes on Bridge 2A over Windy Ridge Parkway receives traffic from I-285 eastbound, Ramp Z, and I-285 westbound Ramp C. Where Ramp C merges into the two-lane section the managed lanes expand to three lanes. These three lanes reduce down to one lane prior to where the ramp from I-75 northbound, Ramp H, combines with the one-lane section. Two managed lanes continue north from the merge point.

**ALTERNATIVE:** (sketch attached)

Continue two managed lanes from where Ramp C merges into the managed lane section all the way to where Ramp H merges in. Provide a short three-lane section for Ramp H to merge into the two-lane section that will continue north.

**ADVANTAGES:**

- Reduces the potential for I-285 traffic to slow down when merging from three lanes to one lane

**DISADVANTAGES:**

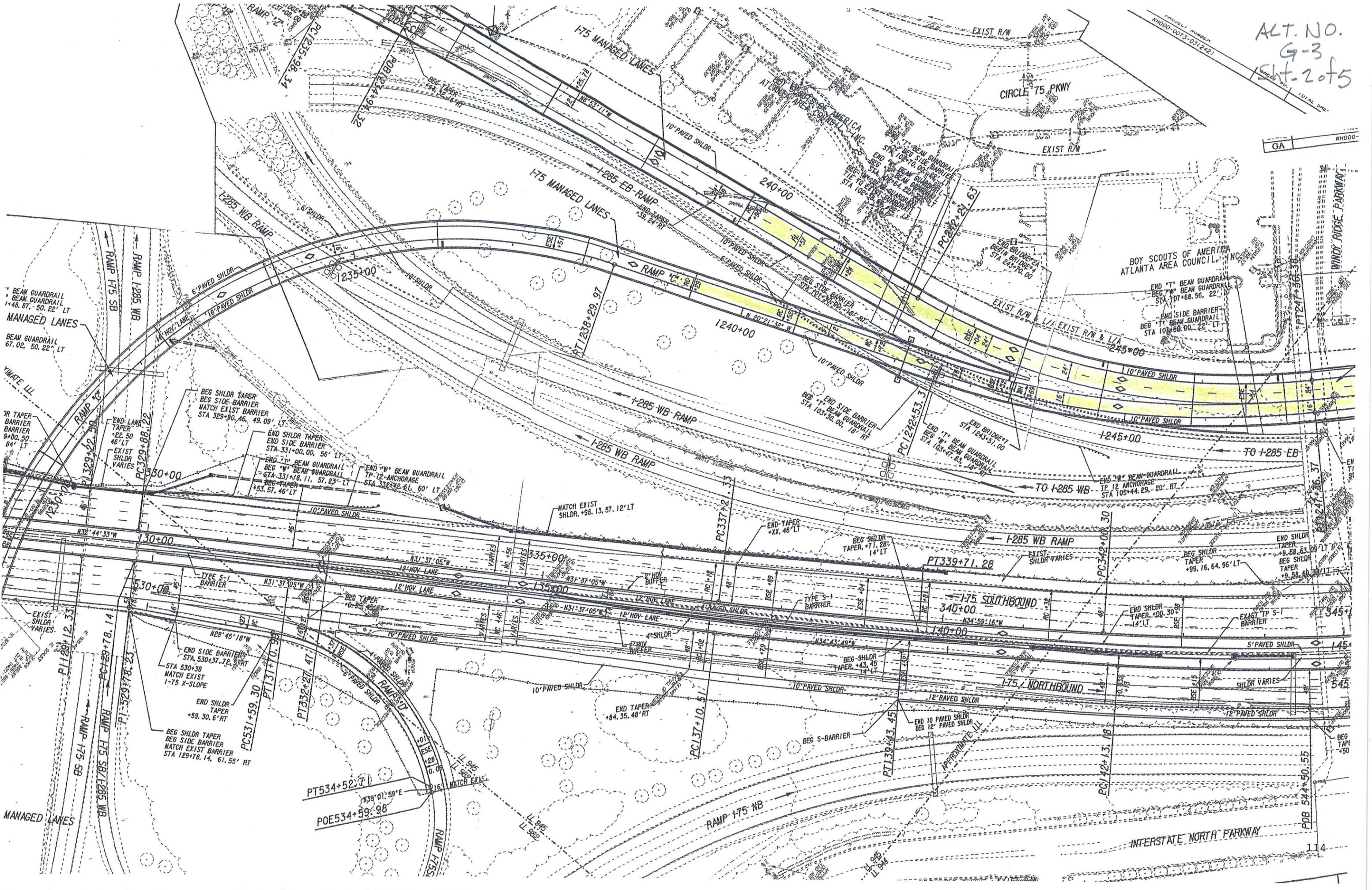
- Adds material and labor requirements
- Traffic from I-75 northbound may be delayed when merging with the vehicles from I-285 already in the managed lanes

**DISCUSSION:**

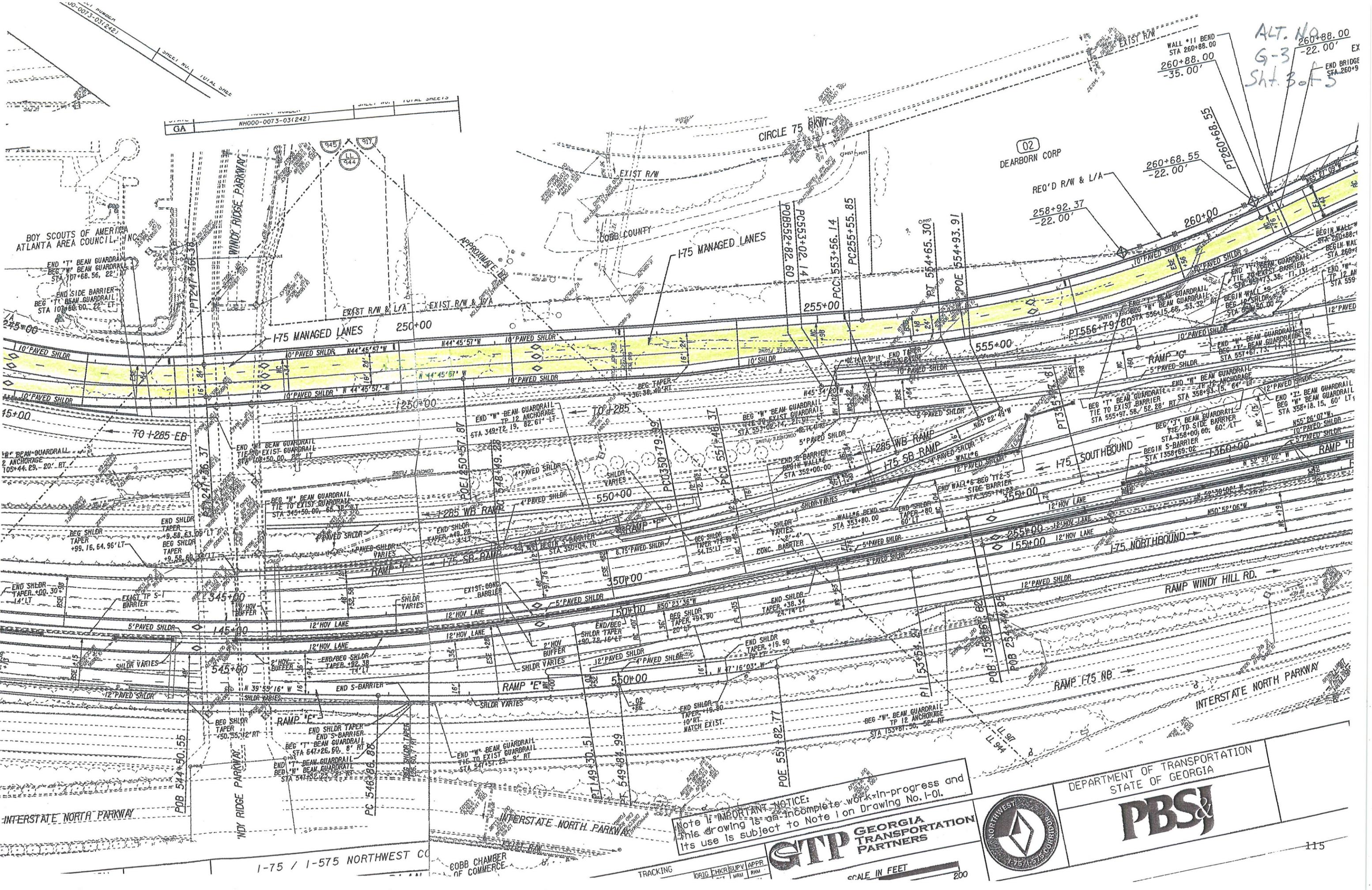
Depending upon traffic volumes on the ramps, there may be less delay overall by maintaining two through lanes for the I-285 traffic on the managed lanes and having the I-75 northbound traffic merge in then reducing a three-lane section to a two-lane section. An analysis should be undertaken to determine the optimum distribution of lanes.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	<b>DESIGN SUGGESTION</b>		
SAVINGS (Original minus Alternative)			

ALT. NO. G-3 Sht. 2 of 5



GA NH000-



ALT. NO. 260+88.00  
 9-3 -22.00' EX  
 SH. 3 of 5  
 END BRIDGE STA. 260+9

BOY SCOUTS OF AMERICA  
 ATLANTA AREA COUNCIL

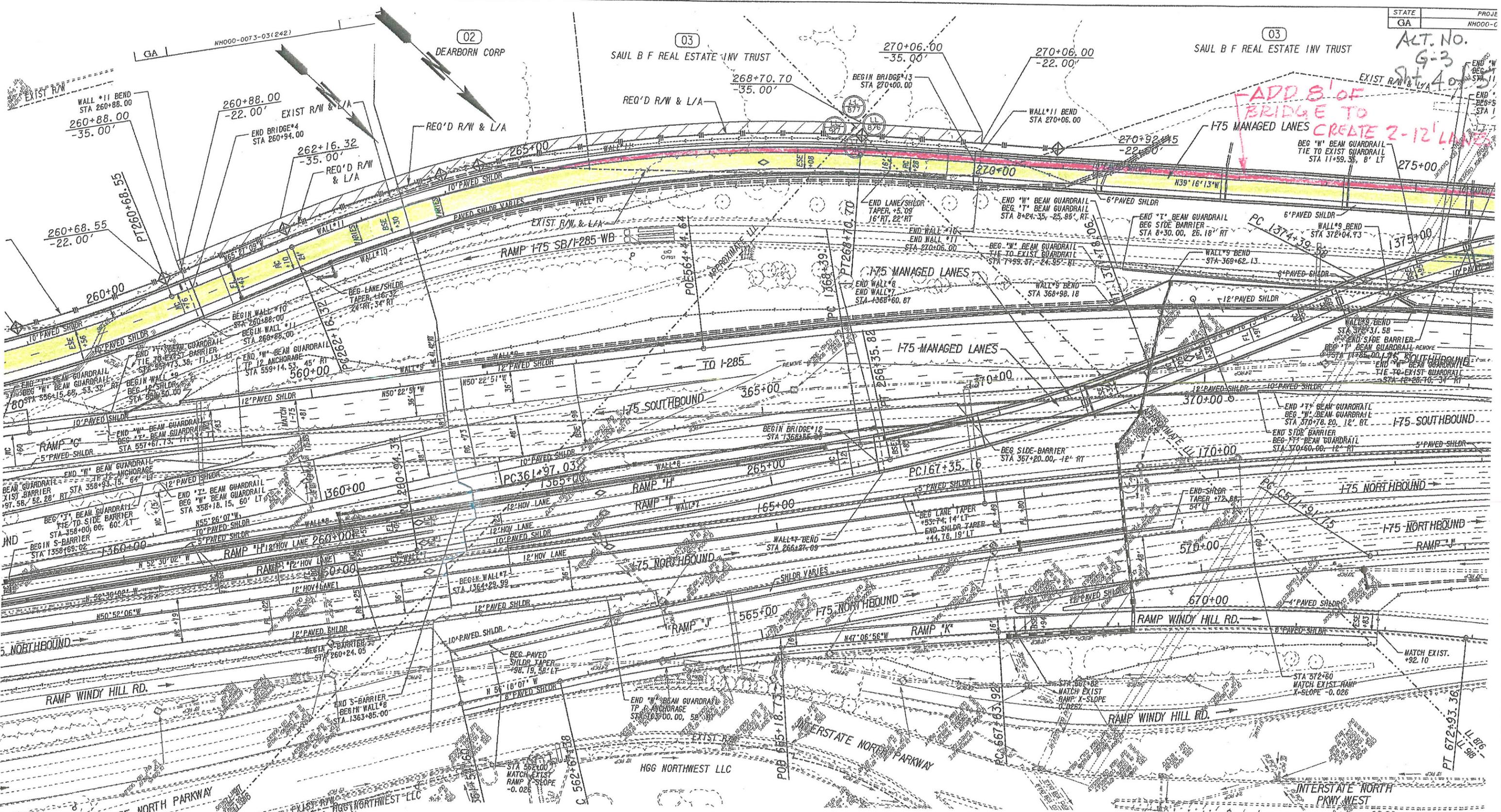
**IMPORTANT NOTICE:**  
 This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

**GTP** GEORGIA TRANSPORTATION PARTNERS



DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

**PBS&**



**ADD 8' OF BRIDGE TO CREATE 2-12' LANES**

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	PCT	MRM	RHM
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

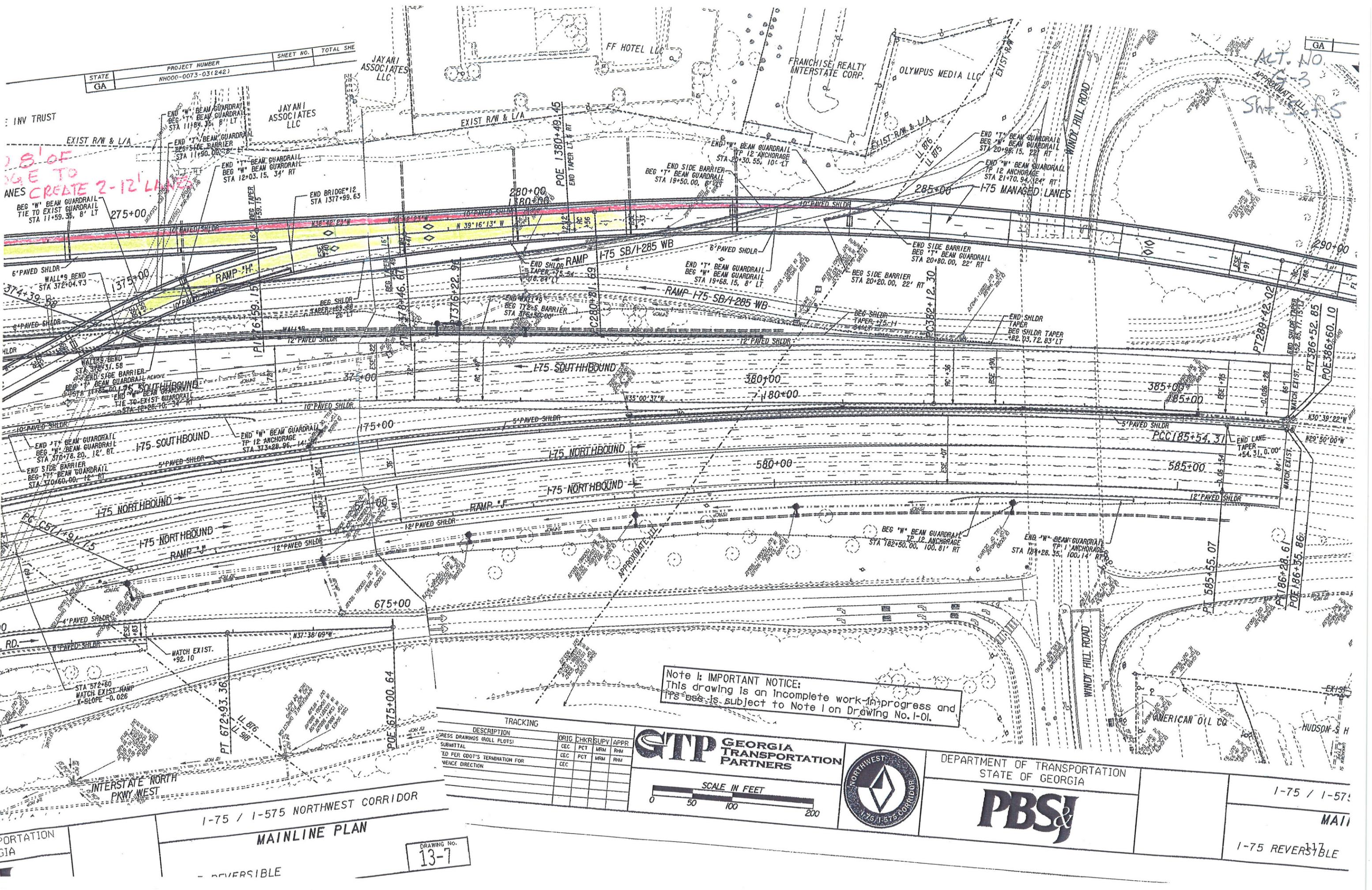


DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

1-75 / 1-575 NORTH  
MAINLINE  
1-75 REVERSIBLE

1-75 / 1-5  
MA  
1-75 REVERSIBLE  
116

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHE
GA	NH000-0073-03(242)		



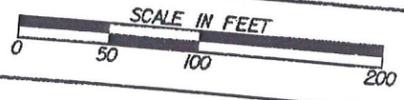
28' OF  
AGE TO  
ANES  
CREATE 2-12' LANES

ACT. NO.  
3  
Sht. 5 of 5

Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. I-01.

TRACKING				
DESCRIPTION	ORIG	CHK	SUPV	APPR
DRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
SUBMITTAL	CEC	PCT	MRM	RHM
ED PER GOVT'S TERMINATION FOR	CEC	PCT	MRM	RHM
VENUE DIRECTION	CEC	PCT	MRM	RHM

**GTP** GEORGIA  
TRANSPORTATION  
PARTNERS



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

**PBS&J**

I-75 / I-575 NORTHWEST CORRIDOR  
MAINLINE PLAN

DRAWING NO.  
13-7

I-75 / I-575  
MAINLINE  
I-75 REVERSIBLE

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**G-4**

DESCRIPTION: **CROSS MANAGED LANES TO EAST SIDE OF I-75 BEGINNING SOUTH OF NORTH MARIETTA PARKWAY**

SHEET NO.: **1 of 24**

**ORIGINAL DESIGN:** (sketch attached)

The current design for the HOV/HOT Lanes are located on the west side of I-75 beginning at Akers Mill Rd. to Hickory Grove Rd.

**ALTERNATIVE:** (sketch attached)

Shift the managed lanes from west to east on I-75 beginning south of the North Marietta Parkway and terminating south of Barrett Parkway, Sta.400+00 to Sta. 765+00.

**ADVANTAGES:**

- Considerable bridge and wall reduction and costs
- Reduces bridge and wall maintenance
- More suitable geometric design – simplifies construction
- Maintenance of traffic savings at I-75/I-575 interchange
- Building in current GDOT right-of-way
- Avoids building a bridge adjacent to an operating railroad
- Avoids interference with commercial facilities
- Avoids wetland areas along Sope Creek
- Reduces construction time
- Provides borrow material within project limits and haul costs
- Avoids impact to a residential property at Bells Ferry Road
- Easier connection to I-575

**DISADVANTAGES:**

- Redesign is required

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 216,000,000	—	\$ 216,000,000
ALTERNATIVE	\$ 193,000,000	—	\$ 193,000,000
SAVINGS (Original minus Alternative)	\$ 23,000,000	—	\$ 23,000,000

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:

**G-4**

DESCRIPTION: **CROSS MANAGED LANES TO EAST SIDE OF I-75 BEGINNING**  
**SOUTH OF NORTH MARIETTA PARKWAY**

SHEET NO.: **2 of 24**

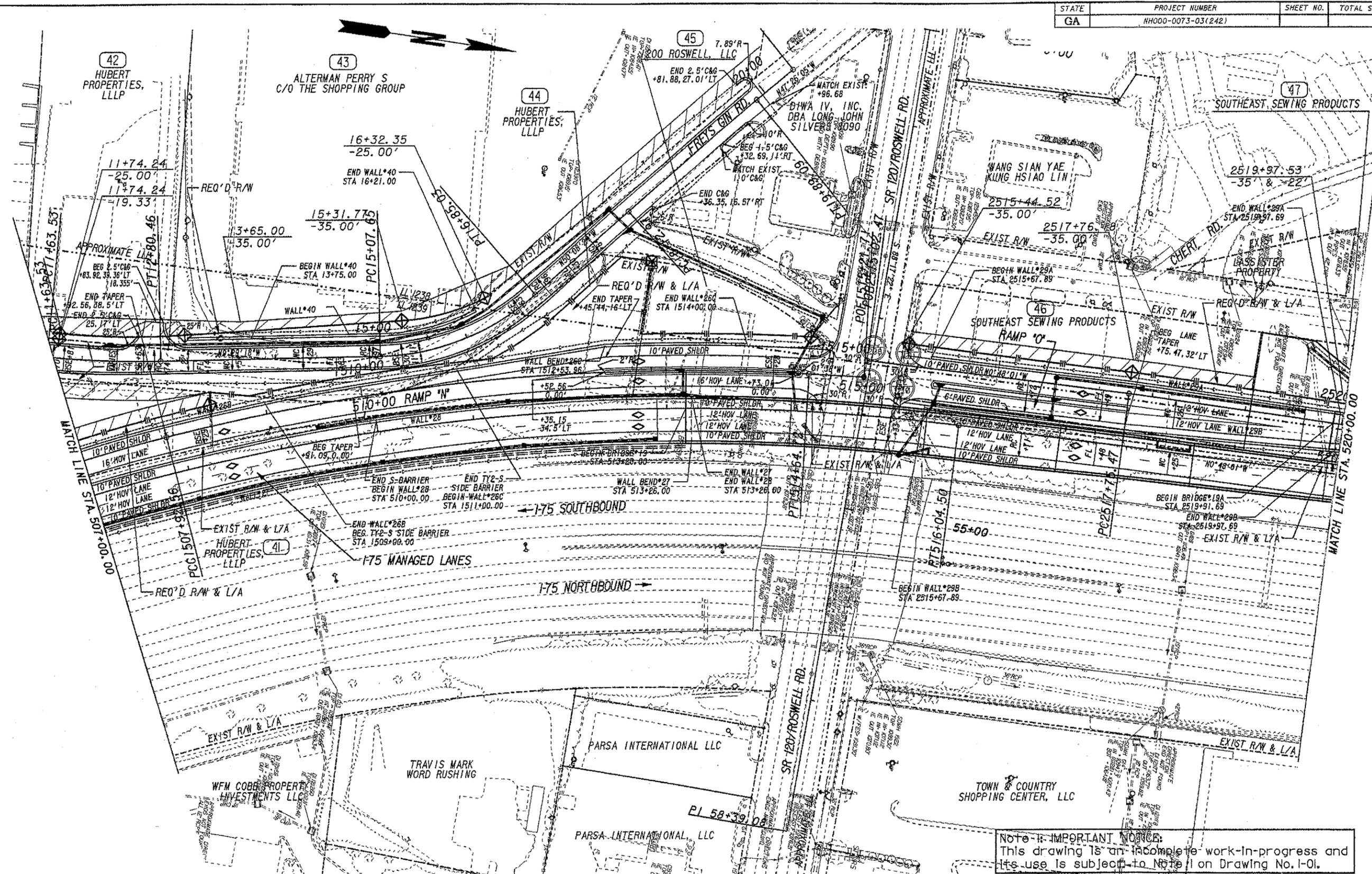
## DISCUSSION:

Shifting the managed lanes just north of Gresham Road, south of North Marietta Parkway, and terminating south of Barrett Parkway will provide considerable reduction of structures and allow more suitable geometric design by constructing the managed lanes within the existing right-of-way on the east side of I-75. There are many environmental impacts that are avoided.

Starting north of SR 120/Roswell Road and south of North Marietta Parkway, there is a significant amount of unused GDOT right-of-way on the west side of I-75. By moving the managed lanes to the east, the area is more conducive to placing the roadway at grade or on embankment formed with mechanically stabilized embankment walls. It also moves the roadway away from the railroad spur that parallels I-75 southbound south of Canton Road and the wetland area between Dixon Road and Bells Ferry Road saving bridge construction in difficult areas to build in. In addition, the residence at Bells Ferry Road ceases to be impacted by the new construction.

Another benefit is that the connection of the managed lanes on I-75 to the managed lane on I-575 is greatly simplified.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

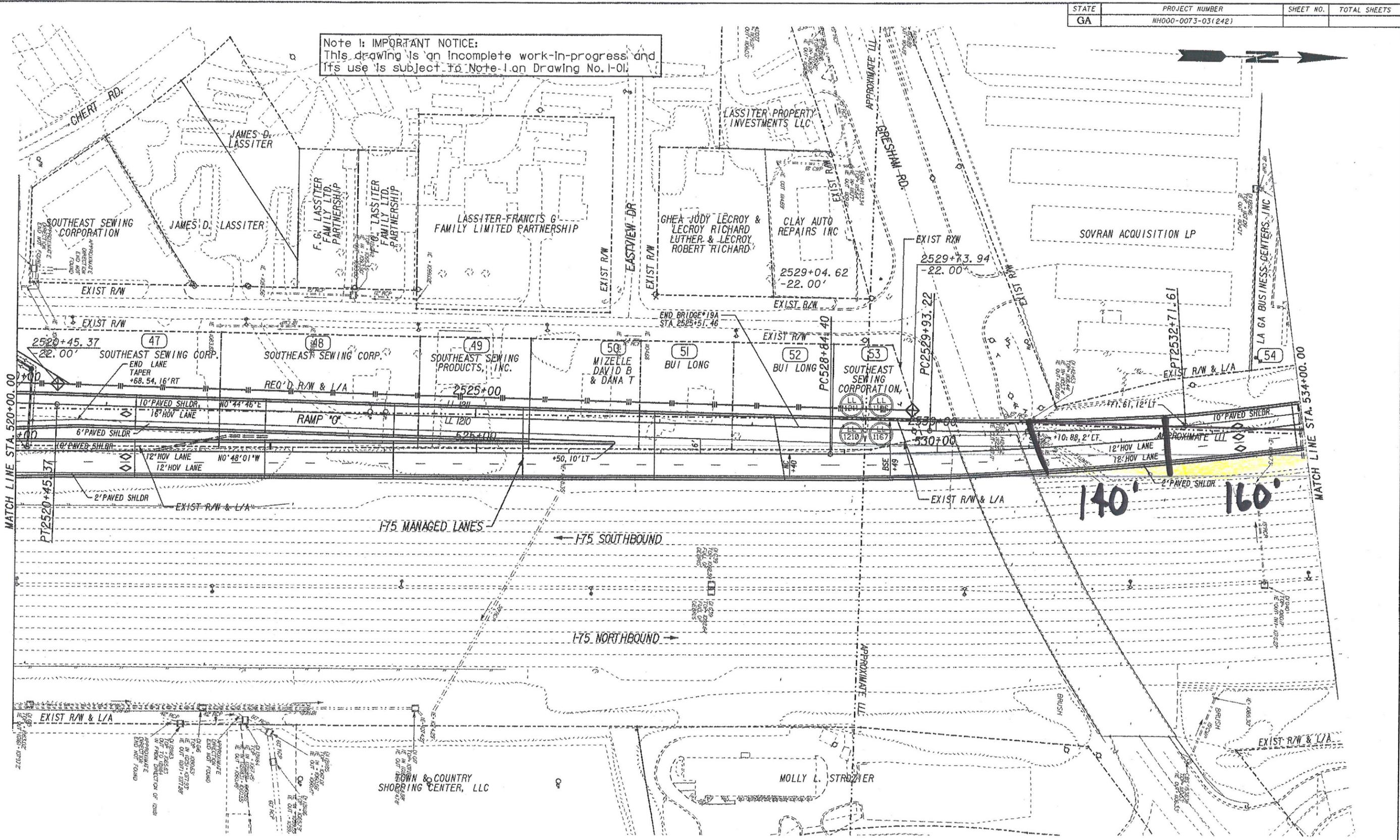


**Note - IMPORTANT NOTICE:**  
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27 NOV 2009 15:24  
 11/27/2009  
 24.dgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:  
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its use is subject to Note 1 on Drawing No. I-01.



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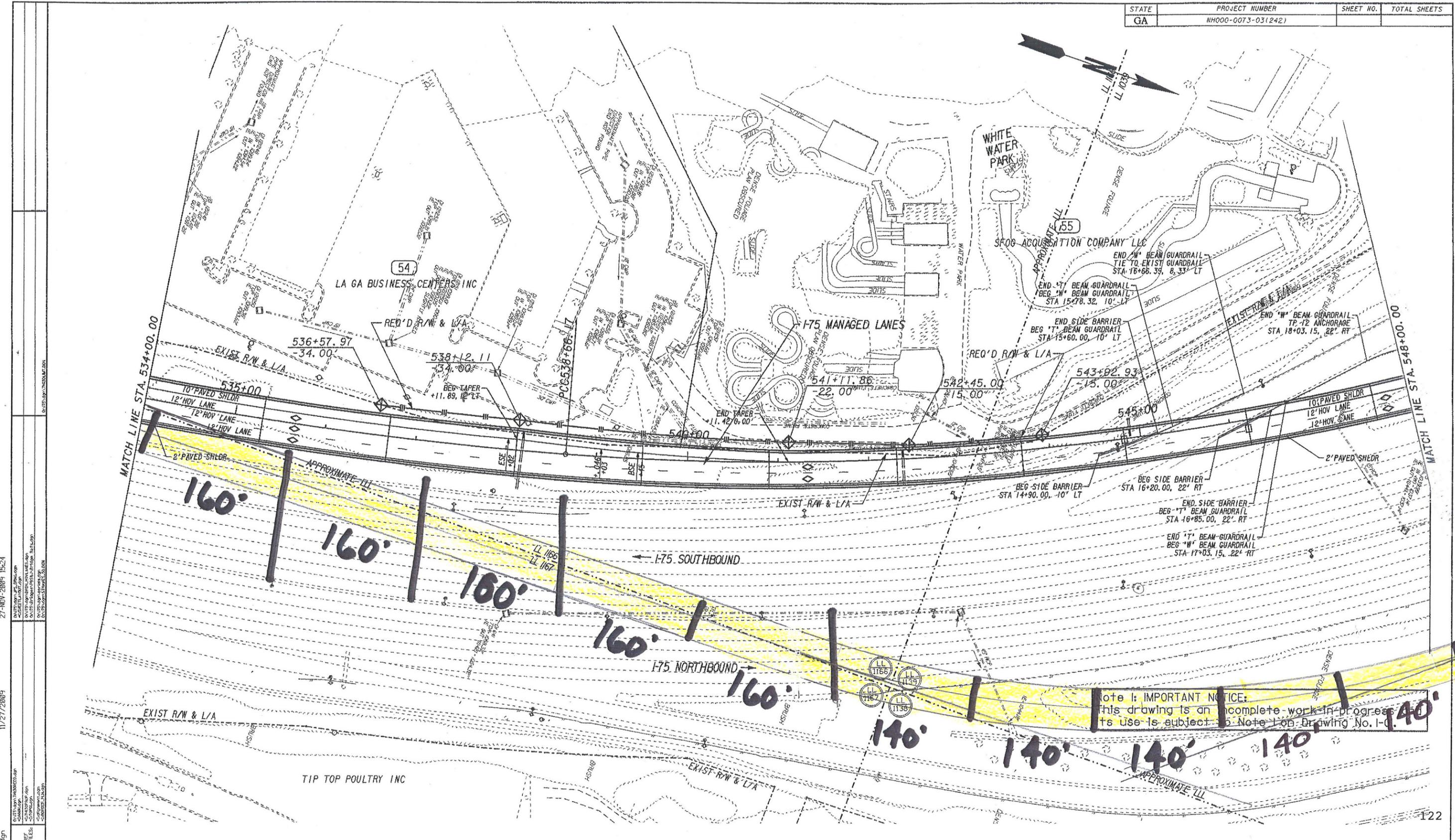
TRACKING		NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
CLARA CASH	9/23/09	A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	DEC	PCT	MRM	RHM



DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

I-75 / I-575 NORTHWEST CORRIDOR

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



27-NOV-2009 15:24

11/27/2009

326.dgn

DWG: I-75 MANAGED LANES  
 DATE: 11/27/2009  
 TIME: 15:24  
 USER: [unreadable]  
 PLOT: [unreadable]

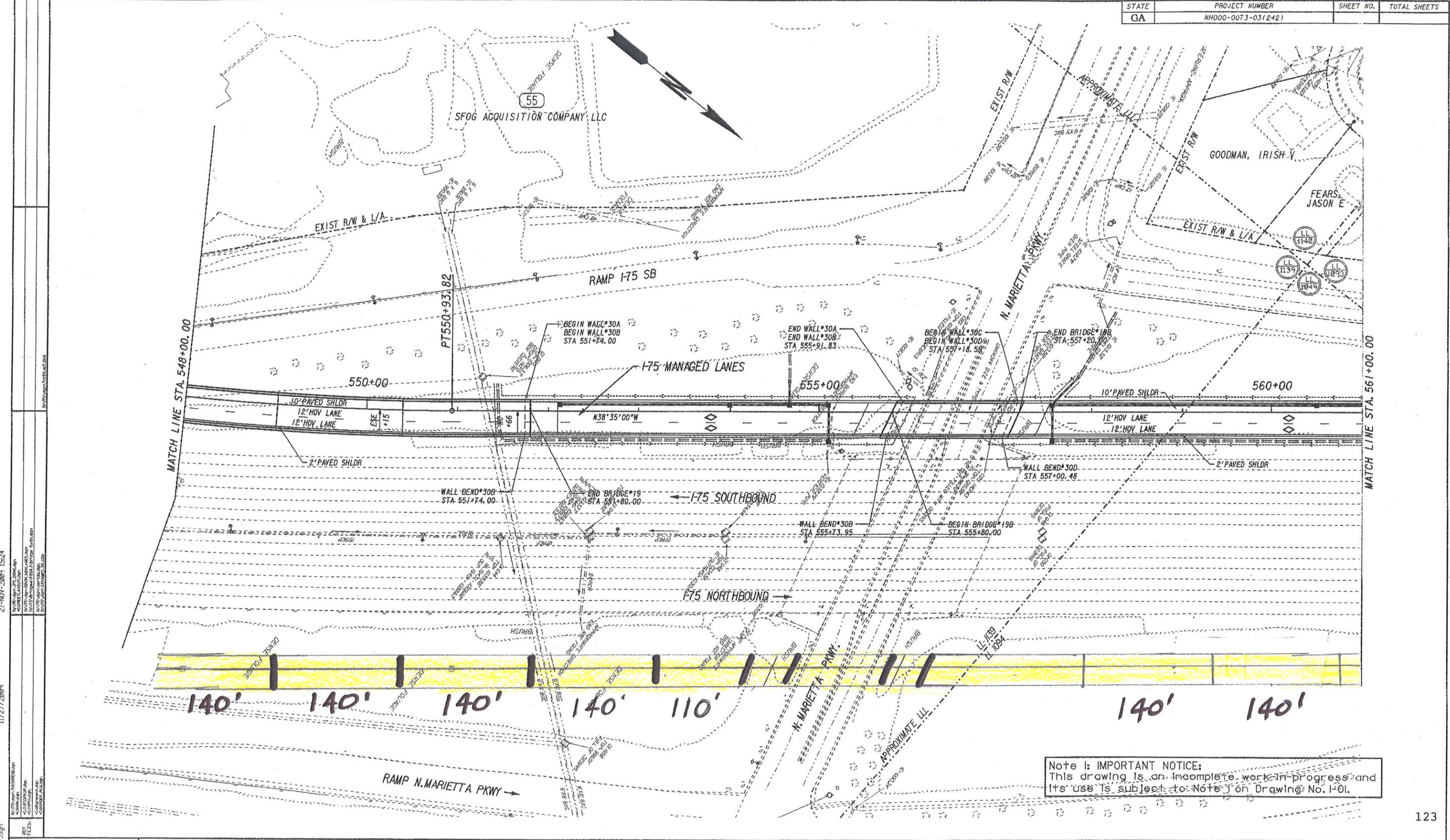
TRACKING

FLORIDA GEORGIA

DEPARTMENT OF TRANSPORTATION

I-75 / I-75 NORTHWEST CORRIDOR

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



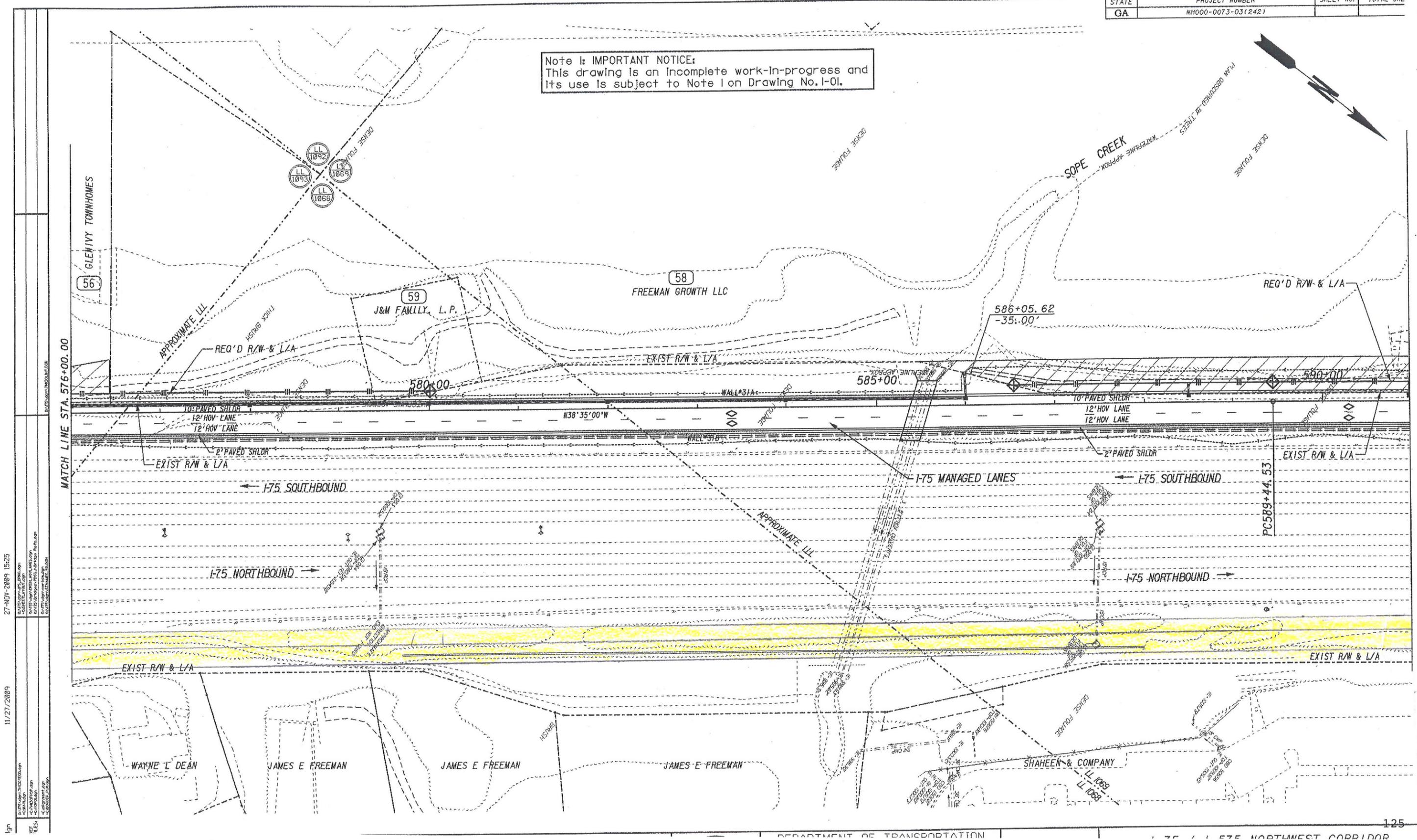
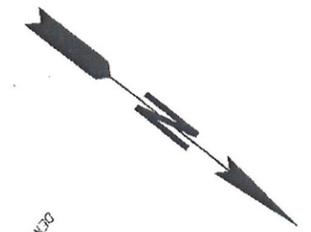
Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

27-N01-2009 15:24  
11/27/2009  
PO27.dgn



STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHE.
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:  
This drawing is an Incomplete work-in-progress and  
Its use is subject to Note 1 on Drawing No. I-01.

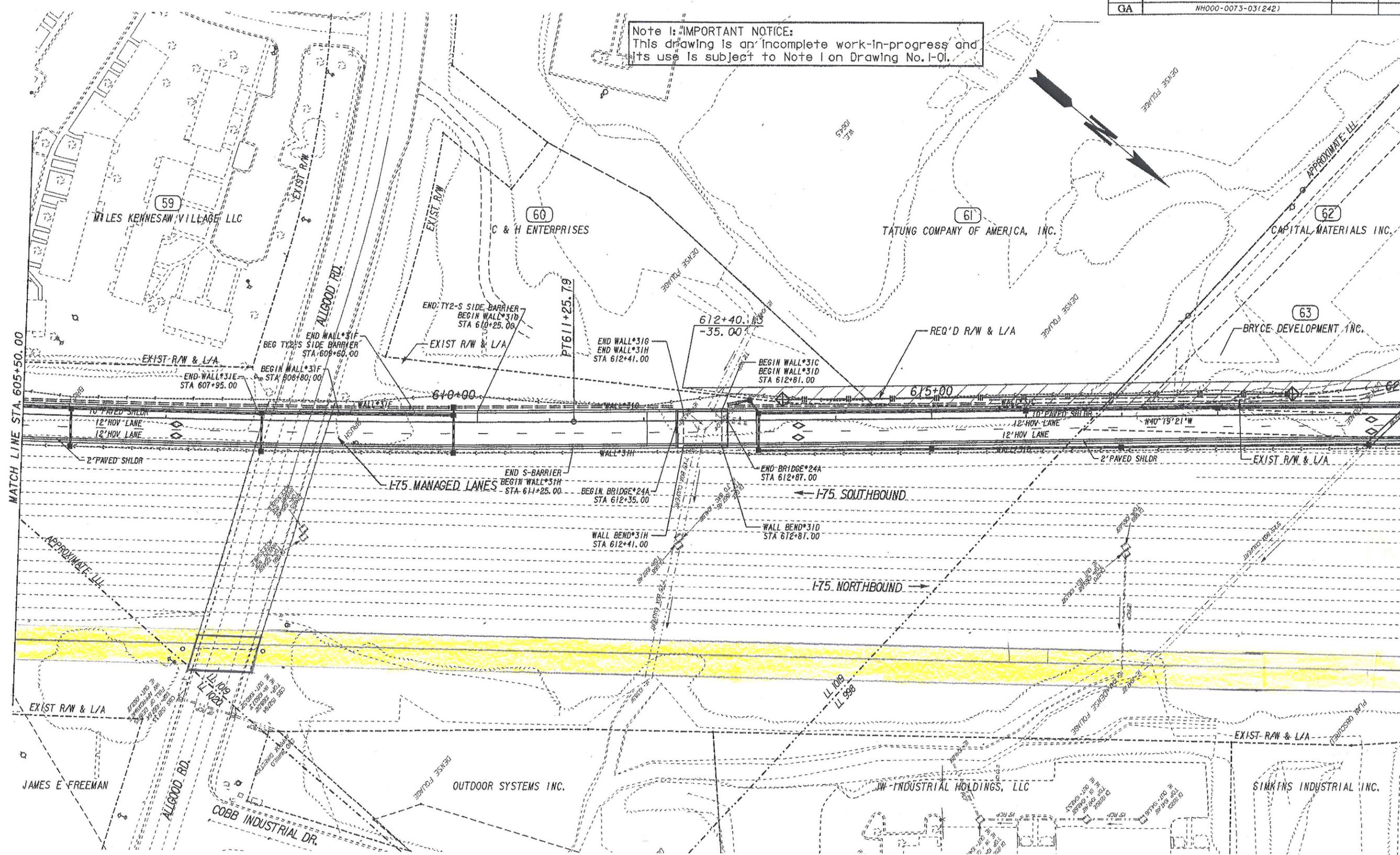


27-NOV-2009 15:25  
11/27/2009  
IGN



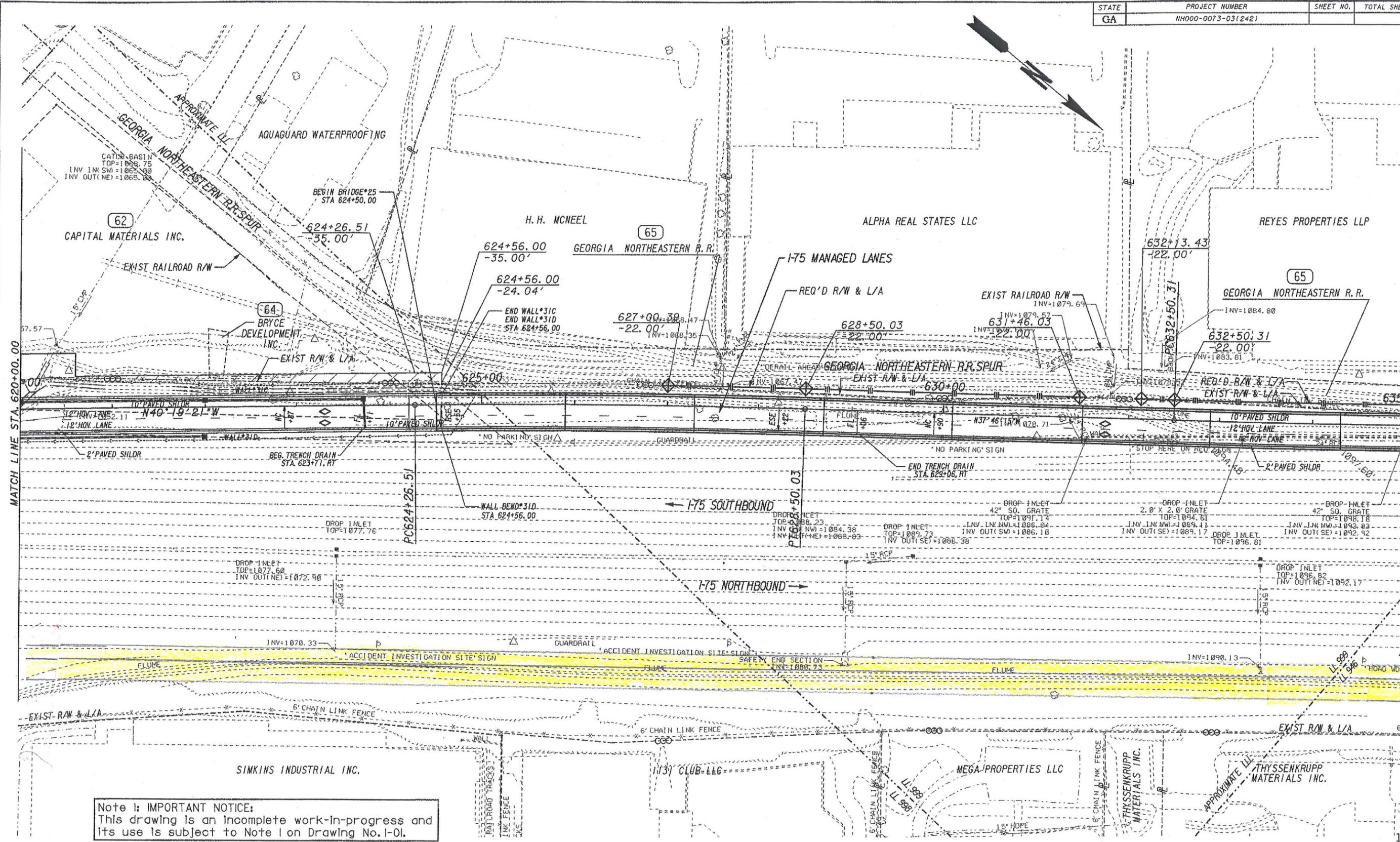
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GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and  
 its use is subject to Note 1 on Drawing No. I-01.



27-NOV-2009 15:26  
 11/27/2009  
 P031.dgn  
 TRACKING

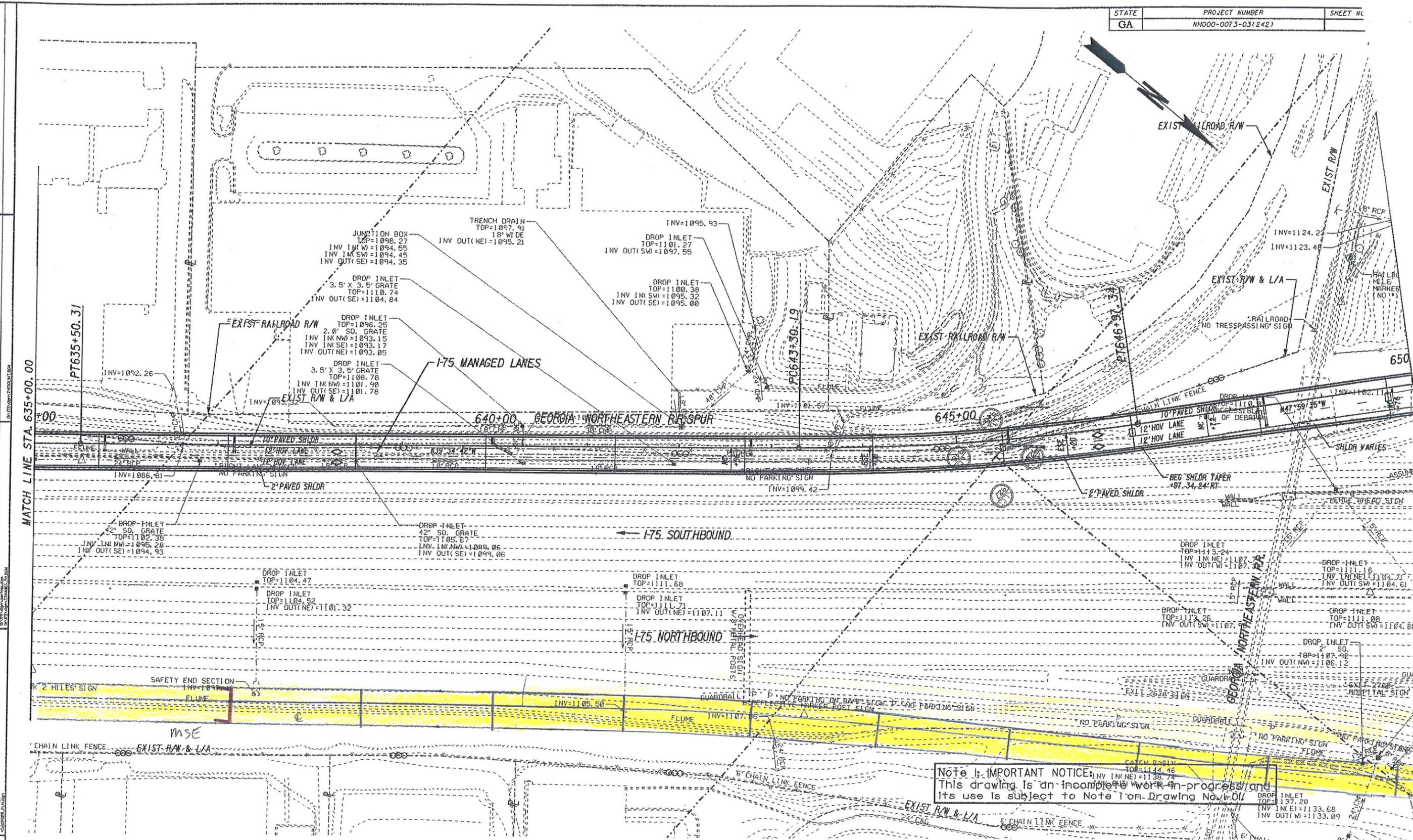
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



**Note 1: IMPORTANT NOTICE:**  
 This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

27-NOV-2009 15:26  
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STATE	PROJECT NUMBER	SHEET NO.
GA	NH000-0073-03(242)	

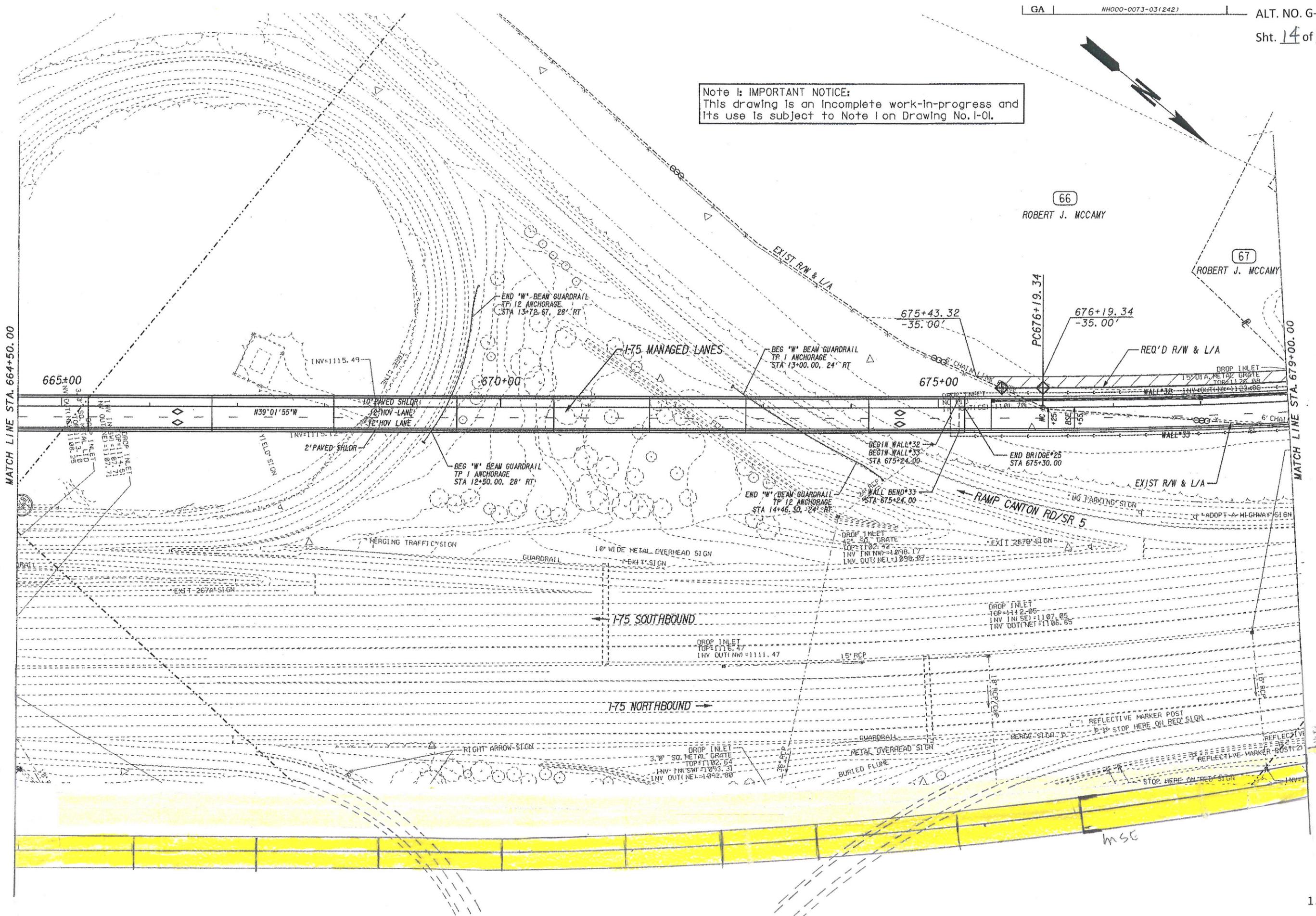


**Note 1: IMPORTANT NOTICE:** This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 01

27-NOV-2009 15:26  
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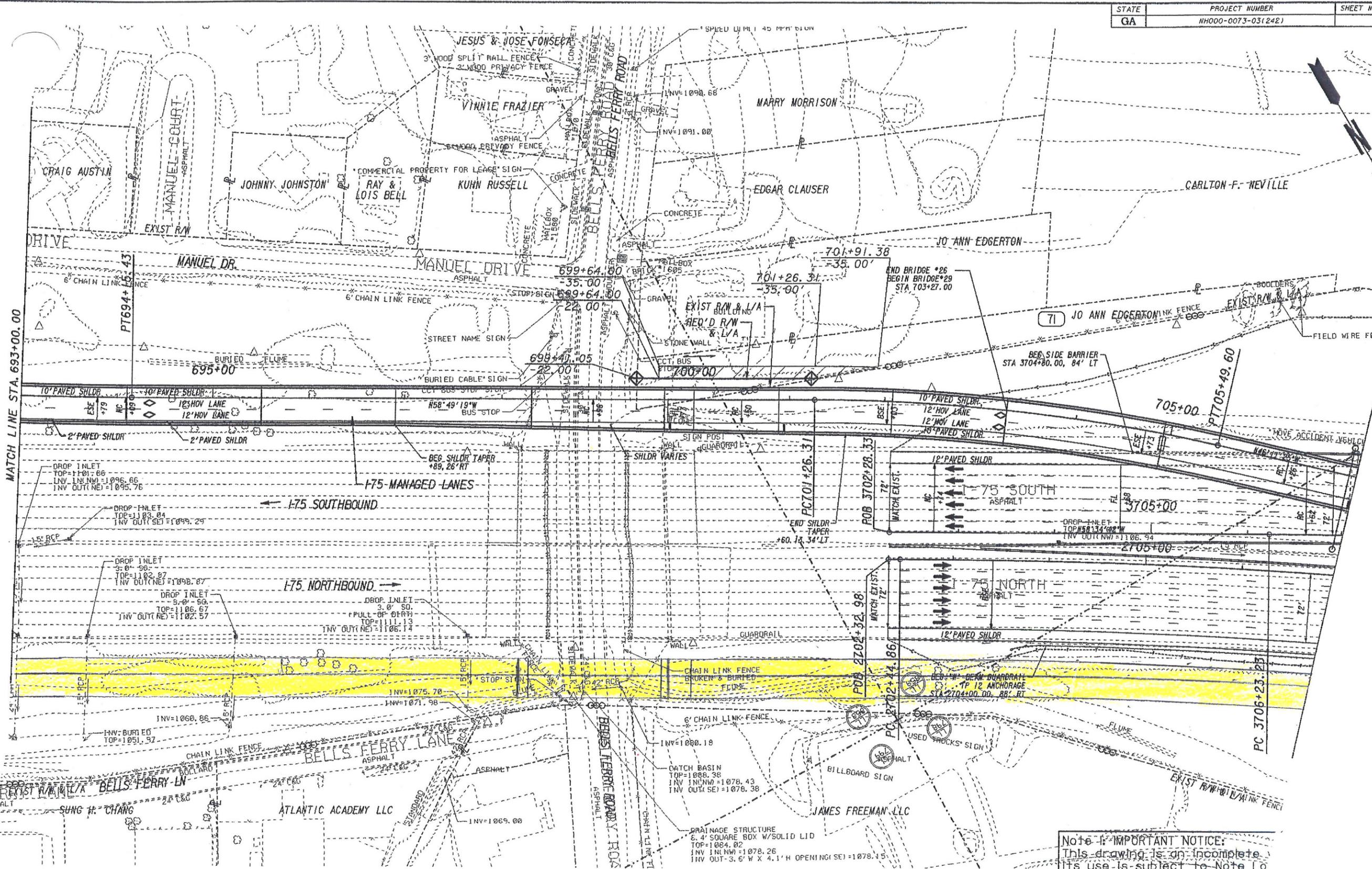
Note 1: IMPORTANT NOTICE:  
This drawing is an incomplete work-in-progress and  
its use is subject to Note 1 on Drawing No. I-01.



27-NOV-2009 15:27  
11/27/2009



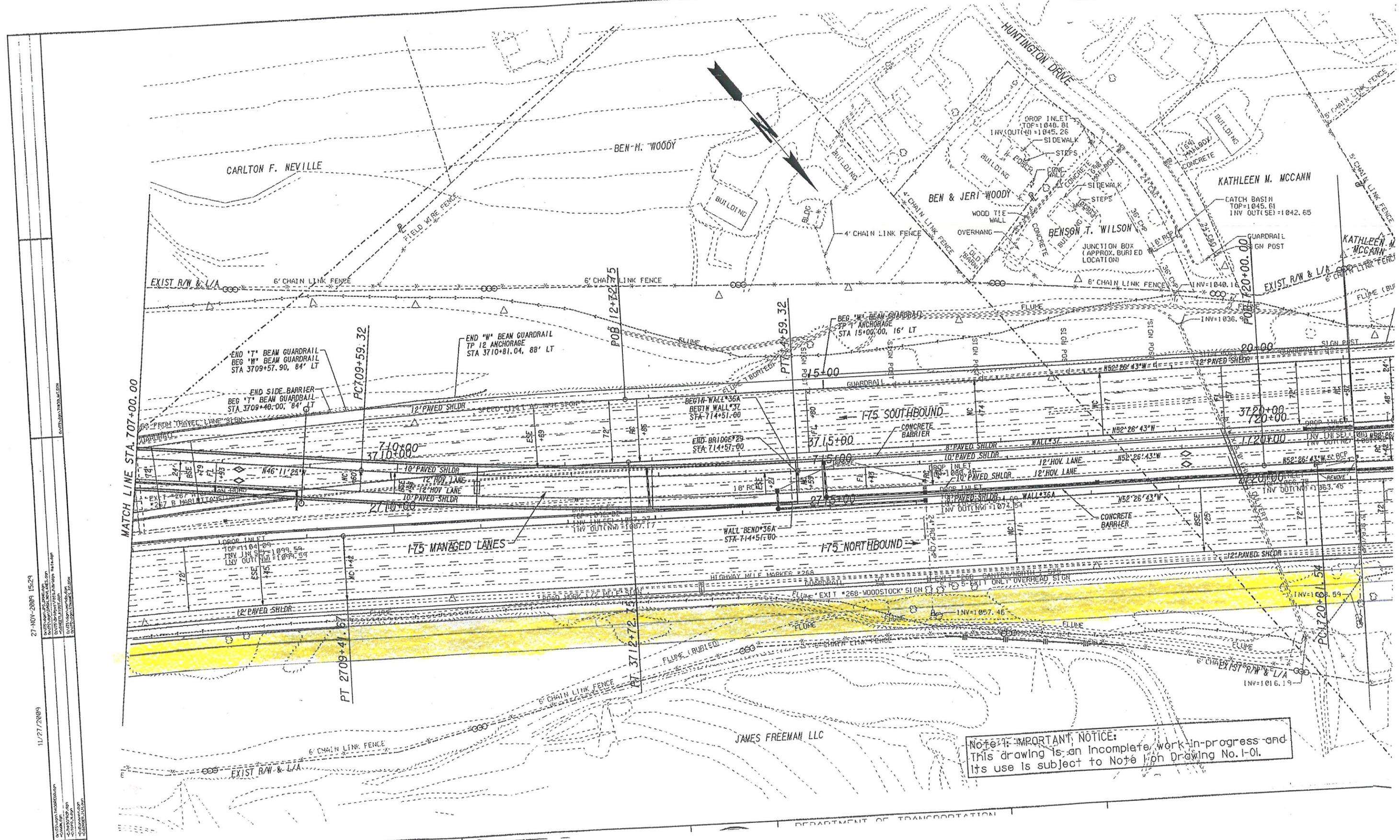
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEET
GA	NH000-0073-03(242)		



Note: IMPORTANT NOTICE:  
This drawing is an incomplete  
Its use is subject to Note 10

27-NOV-2009 15:28  
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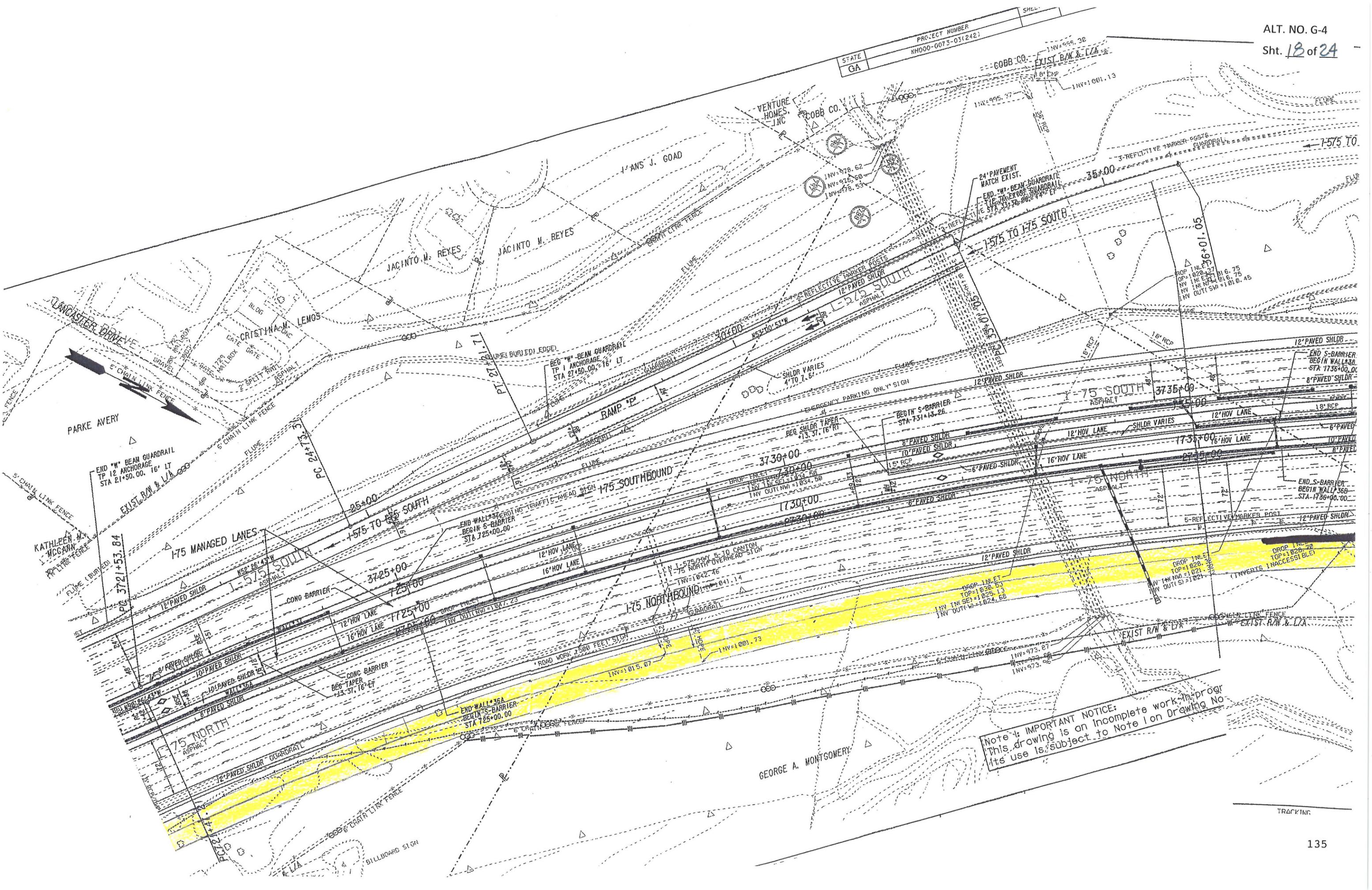
G-4



**NOTE: IMPORTANT NOTICE:**  
 This drawing is an incomplete work-in-progress and its use is subject to Notice on Drawing No. I-01.

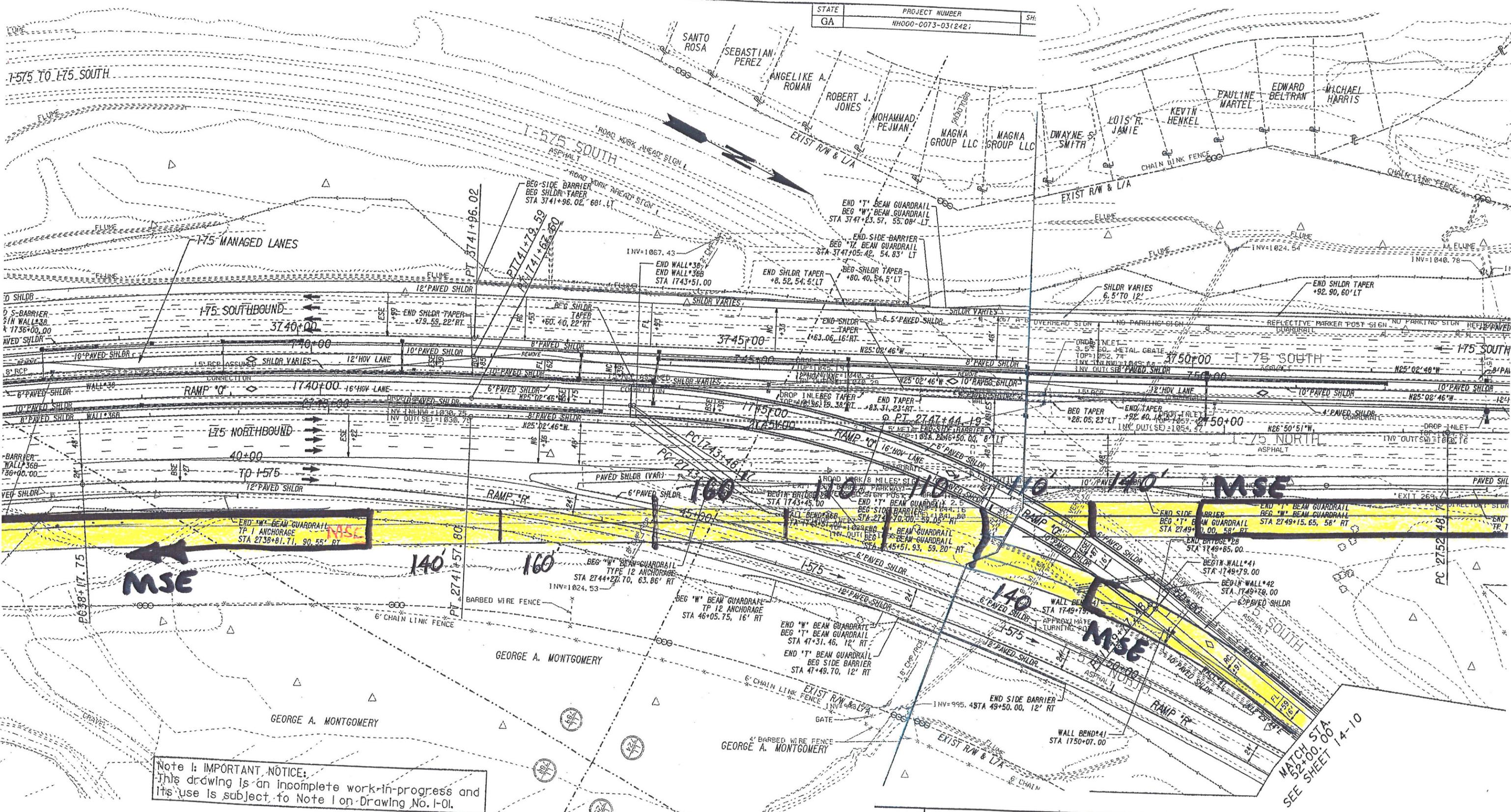
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 REF FILES:  
 TRACKING

STATE	PROJECT NUMBER	SHEET
GA	NH000-0073-03(242)	



Note: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress  
 Its use is subject to Note 1 on Drawing No.

STATE	PROJECT NUMBER	SH:
GA	NH000-C073-03(242)	



Note 1: IMPORTANT NOTICE:  
 This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

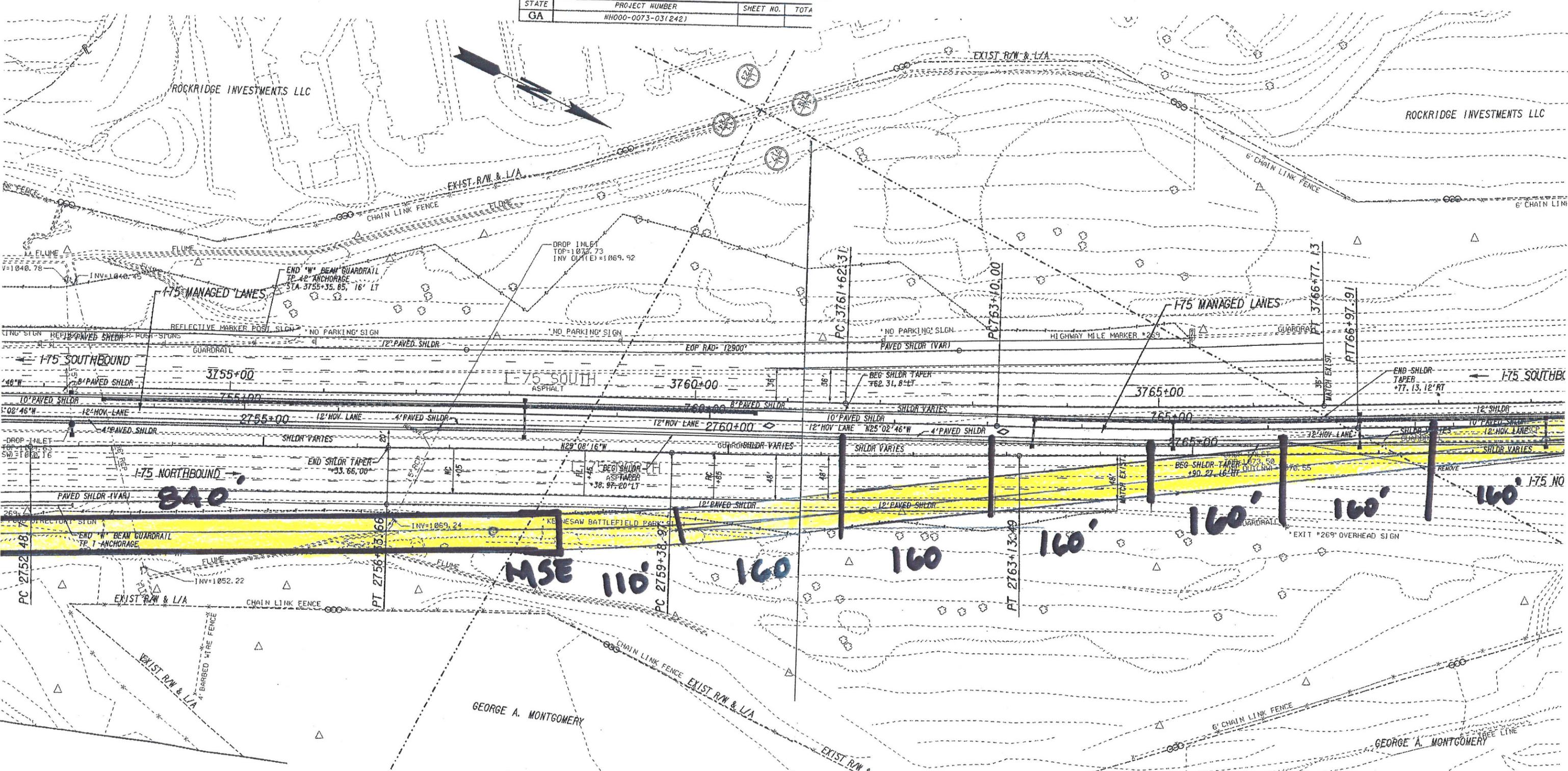
TRACKING						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	PCT	MRM	RHM
PLUDED PER SUDO'S TERMINATION FOR CONVENIENCE DIRECTION			CEL			

**GTP** GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET



STATE	PROJECT NUMBER	SHEET NO.	TOTAL
GA	NH000-0073-03(242)		



Note 1: IMPORTANT NOTICE:  
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 its use is subject to Note 1 on Drawing No. I-01.

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DEPARTMENT OF TRANSPORTATION  
 STATE OF GEORGIA

1-75 / I-575 NORTHWEST CORRIDOR  
 MAINLINE PLAN

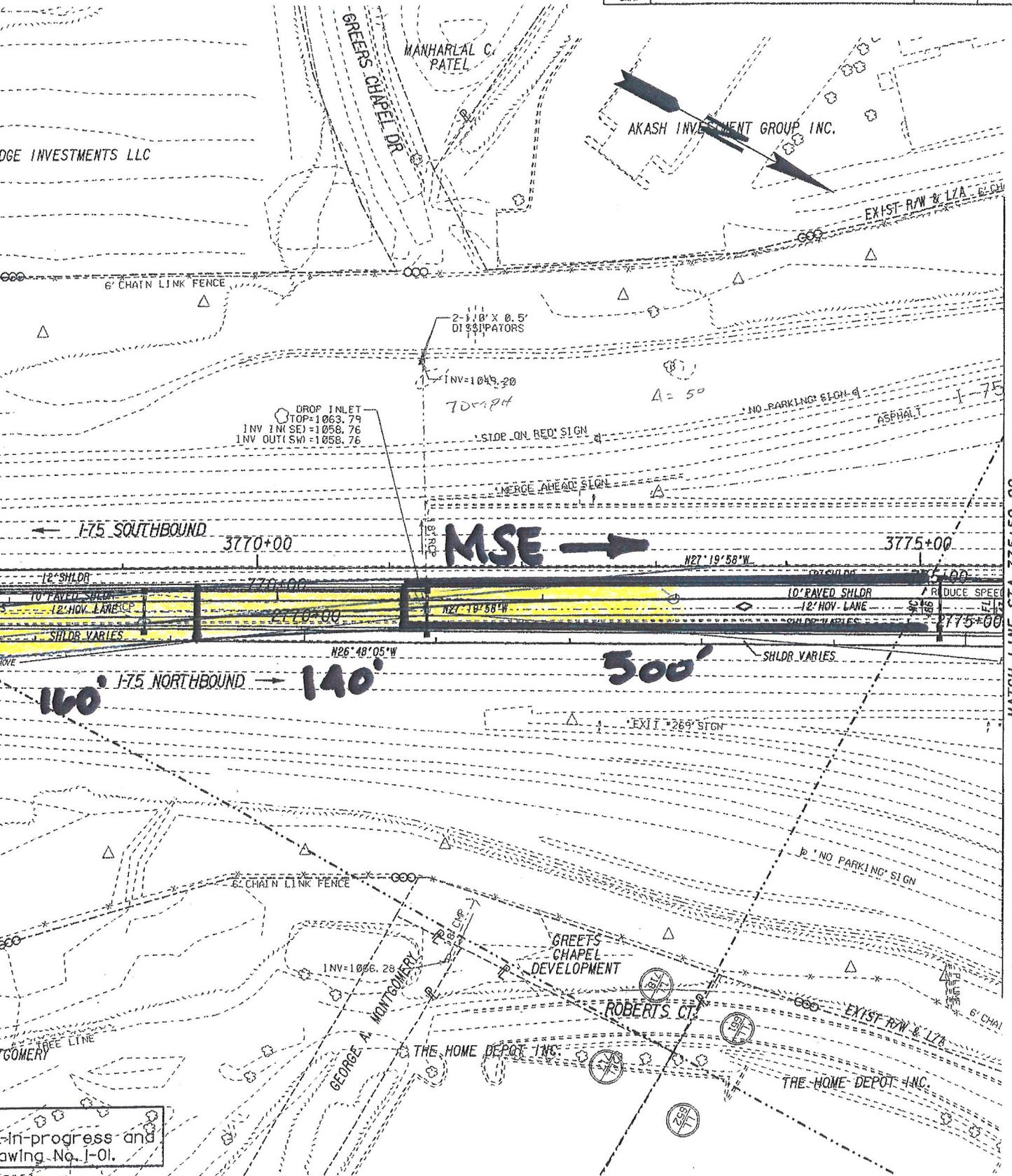
9/23/09

TRACKING		ORIG	CHKD	SUPV	APPR	
NO	DATE	DESCRIPTION	CEC	PCT	MRM	RHM
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	CEC	PCT	MRM	RHM
C	10/30/09	PLOTTED PER GDOT'S TERMINATION FOR	CEC			

DEPAR 137

ALT. NO.  
G-4  
Sht. 21 of 24

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



In-progress and pending No. 1-01.

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
 NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
 Cobb and Cherokee Counties, GA

ALT. NO.:

**G-4**

SHEET NO.: **22 of 24**

Existing Bridge:

Bridge 19: From Gresham Road Length= 551+80 – 531+10 ft= 2,070 Width= 39.25 ft (not incl. tapers) Area= 81,248 sf	Bridge 19B: 140 ft 39.25 ft 5,495 sf	Bridge 19C: 530 ft 39.25 ft 20,803 sf	Bridge 24A: 52 ft 39.25 ft 2,041 sf	
Bridge 25: Length= 5,080 Width= 43.25 Area= 219,710	Bridge 26: 1,897 ft 39.25 ft 74,457 sf	Bridge 28: 640 ft 35.25 ft 22,560 sf	Bridge 29: 1,130 ft 47.25 ft 53,393 sf	<b>SUM= 479,707 SF</b>

New Bridge:

Bridge 19 Extension: From Gresham Road across I-75 from west side to east side)

Length= 140'+(6x160')+(8x140')+320+(8x140')= 3,660 ft

Width= 39.25 ft (not including tapers at beginning – same as existing)

Area= 143,655 sf

Bridge @ Dickson Road:

Length= 160 ft.

Width= 40.5 ft

Area= 6,480 sf

Bridge @ Bells Ferry Rd:

Length= 160 ft

Width= 40.5 ft

Area= 6,480 sf

Bridge @ Canton Road Connector/Hwy 5 (*note that careful review could result in some of the bridge converted to a confined earth section supported by MSE walls*)

Length = 3,960 ft.

Width = 39.25 ft.

Area = 155,430 ft.

Bridge @ I-575:

Length= 140'+(2x160')+(3x110')+(2x140')= 1,070 ft.

Width= 47.25 ft.

Area= 50,558 sf.

Bridge @ I-75NB Cross-over:

Length= 110'+(6x160')+140'= 1,210 ft.

Width= 16'+10'+6'+3.25' = 35.25 ft.

Area= 42,653 sf.

**SUM= 405,256 SF**

Bridge Area at Allgood Road: (M/L under on east side)

**Existing to be removed = 66.42(54.18) = 3600 sf**

Span to be constructed = 80(66.42) = 5,314 sf

Wall area = 91(20) + 20(40) = 2620 sf

**TOTAL BRIDGE = 410,570 sf**

# CALCULATIONS



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640  
Cobb and Cherokee Counties, GA

ALT. NO.:

**G-4**

SHEET NO.: **23 of 24**

## Existing Walls:

Walls 32 & 33:

$$\text{Length} = 684 + 36 - 675 + 30 = 906 \text{ ft}$$

$$\text{Height} = (1148.34 - 1111.9) / 2 = 18.22 \text{ ft}$$

$$\text{Area} = 16,507 \times 2 = 33,015 \text{ sf}$$

Walls 36A & 37:

$$\text{Length} = 1092 + 1050 = 2,142 \text{ ft}$$

$$\text{Height} = (1119.72 - 1083.7) / 2 = 18 \text{ ft}$$

$$\text{Area} = 38,556 + (26' \times 47') = 39,792 \text{ sf}$$

Walls 36B & 38:

$$\text{Length} = 784 + 804 = 1,588 \text{ ft}$$

$$\text{Height} = (1074 - 1040) / 2 = 17 \text{ ft}$$

$$\text{Area} = 26,996 + (25' \times 47') = 28,171 \text{ sf}$$

Walls 41 & 42:

$$\text{Length} = 730 + 821 = 1,551 \text{ ft}$$

$$\text{Height} = (35.6 + 3) / 2 = 19.3 \text{ ft}$$

$$\text{Area} = 29,934 + (25' \times 47') = 31,109 \text{ sf}$$

**SUM = 132,087 SF**

## New Walls:

Walls East:  $\text{Area} = (600') \times (25' / 2) + (637 + 10 - 567 + 75) \times 15' = 111,525 \text{ sf}$

Wall @ I-575:  $\text{Area} = 450' \times (25' / 2) + 2 \times 500' \times (25' / 2) = 18,125 \text{ sf}$

Wall I-75:  $\text{Area} = (2) \times 840' \times (25' / 2) + 2 \times 500' \times (25' / 2) = 33,500 \text{ sf}$

**SUM = 165,770 SF**

## Roadway Design

Existing Roadway Length (West Side of I-75)

$$14,519' \times 36' = 522,684 \text{ SF} / 9 = 58,076 \text{ SY} \times \$167.68 \text{ SY (Estimated Costs for proposed pavement)}$$
$$= \$9,738,183.68$$

Proposed Roadway Length (East Side of I-75)

$$14,320' \times 36' = 515,520 \text{ SF} / 9 = 57,280 \text{ SY} \times \$167.68 \text{ SY (Estimated Costs for proposed pavement)}$$
$$= \$9,604,710.40$$

# COST WORKSHEET



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES** ALTERNATIVE NO.: **G-4**  
*NH000-0073-03(242), P.I. No. 714130*

SHEET NO.: **24 of 24**

PROJECT ITEM		ORIGINAL ESTIMATE			ALTERNATIVE ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Bridge Area	SF	479,707	379.00	181,808,953	410,570	379.00	155,606,030
Road Area	SY	58,076	167.68	9,738,184	57,280	167.68	9,604,710
MSE Walls	SF	132,087	101.00	13,340,787	165,770	101.00	16,742,770
Earthwork	CY				54,863	68.00	3,730,684
Bridge Demo	SF				3,600	37.90	136,440
<b>Construction Subtotal</b>				204,887,924			185,820,634
Right-of-Way	SF	63,054	20.00	1,261,080			
Construction Easement	SF	74,409	10.00	744,090			
Drainage Easement	SF	1,500	20.00	30,000			
Residential	EA	1	879,323.00	879,323			
Residential Relocation	EA	1	120,000.00	120,000			
<b>Subtotal Righ-of-Way</b>				3,034,493			
<b>Construction Subtotal</b>				204,887,924			185,820,634
<b>Markup (%) at</b>		<b>4%</b>		8,195,517			7,432,825
<b>TOTAL</b>				216,117,934			193,253,459
<b>TOTAL (ROUNDED)</b>				216,000,000			193,000,000

# VALUE ENGINEERING ALTERNATIVE



**PROJECT: I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**G-5**

**DESCRIPTION: CROSS MANAGED LANES TO EAST SIDE OF I-75 BEGINNING**  
**SOUTH OF NORTH MARIETTA PARKWAY AND ADD ACCESS**  
**LANES AT BELLS FERRY ROAD**

SHEET NO.: 1 of 2

**ORIGINAL DESIGN:** (See Alt. No. G-4 for sketch)

The current design for the HOV/HOT Lanes are located on the west side of I-75 beginning at Akers Mill Rd. to Hickory Grove Rd.

**ALTERNATIVE:** (See Alt. No. G-4 for sketch)

Shift the managed lanes from west to east on I-75 beginning south of the North Marietta Parkway and terminating south of Barrett Parkway, Sta. 400+00 to Sta. 765+00. Add access lanes at Bells Ferry Road.

**ADVANTAGES:**

- Considerable bridge and wall reduction and costs
- Reduces bridge and wall maintenance
- More suitable geometric design – simplifies construction
- Maintenance of traffic savings at I-75/I-575 interchange
- Building in current GDOT right-of-way
- Avoids building a bridge adjacent to an operating railroad
- Avoids interference with commercial facilities
- Avoids wetland areas along Sope Creek
- Reduces construction time
- Provides borrow material within project limits and haul costs
- Avoids impact to a residential property at Bells Ferry Road
- Easier connection to I-575

**DISADVANTAGES:**

- Redesign is required

**DISCUSSION:**

This alternative has all of the benefits of Alt. No. G-4 but also provides a connection to the managed lanes at Bells Ferry Road.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 216,000,000	—	\$ 216,000,000
ALTERNATIVE	\$ 194,000,000	—	\$ 194,000,000
SAVINGS (Original minus Alternative)	\$ 22,000,000	—	\$ 22,000,000

# COST WORKSHEET



PROJECT: **I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES** ALTERNATIVE NO.: **G-4**  
*NH000-0073-03(242), P.I. No. 714130*

SHEET NO.: **2 of 2**

PROJECT ITEM		ORIGINAL ESTIMATE			ALTERNATIVE ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Bridge Area	SF	479,707	379.00	181,808,953	410,570	379.00	155,606,030
Road Area	SY	58,076	167.68	9,738,184	57,280	167.68	9,604,710
MSE Walls	SF	132,087	101.00	13,340,787	165,770	101.00	16,742,770
Earthwork	CY				54,863	68.00	3,730,684
Bridge Demo	SF				3,600	37.90	136,440
Ramps to Bells Ferry Road	LS				1	1,000,000	1,000,000
<b>Construction Subtotal</b>				204,887,924			186,820,634
Right-of-Way	SF	63,054	20.00	1,261,080			
Construction Easement	SF	74,409	10.00	744,090			
Drainage Easement	SF	1,500	20.00	30,000			
Residential	EA	1	879,323.00	879,323			
Residential Relocation	EA	1	120,000.00	120,000			
<b>Subtotal Righ-of-Way</b>				3,034,493			
<b>Construction Subtotal</b>				204,887,924			186,820,634
<b>Markup (%) at 4%</b>				8,195,517			7,472,825
<b>TOTAL</b>				216,117,934			194,293,459
<b>TOTAL (ROUNDED)</b>				216,000,000			194,000,000

# VALUE ENGINEERING ALTERNATIVE



**PROJECT: I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES**  
*NH000-0073-03(242), P.I. No. 714130; NH000-0575-01(028), P.I. No. 713640*  
*Cobb and Cherokee Counties, GA*

ALTERNATIVE NO.:  
**G-6**

**DESCRIPTION: FROM THE MERGE POINT OF RAMP C AND THE TWO  
 MANAGED LANES ON BRIDGE 2A TO WHERE RAMP H  
 MERGES IN, PROVIDE A TWO-LANE SECTION THAT  
 REDUCES TO ONE LANE AND THEN EXPANDS TO TWO  
 LANES**

SHEET NO.: 1 of 4

**ORIGINAL DESIGN:** (sketch attached)

In the night-time period, the two-lane section of I-75 managed lanes on Bridge 2A over Windy Ridge Parkway receives traffic from I-285 eastbound, Ramp Z, and I-285 westbound Ramp C. Where Ramp C merges into the two-lane section the managed lanes expand to three lanes. These three lanes reduce down to one lane prior to where the ramp from I-75 northbound, Ramp H, combines with the one-lane section. Two managed lanes continue north from the merge point.

**ALTERNATIVE:** (sketch attached)

Reduce the two-lane section of Bridge 2A from where Ramp B merges with Ramp Z to just before the merge point of Ramp C to one lane. Then reduce the three-lane section on Bridge 2A from where Ramp C merges in to two lanes followed by a merging of the two lanes into one lane prior to where Ramp H merges in.

**ADVANTAGES:**

- Eliminates some bridge
- Reduces bridge maintenance requirements
- Reduces construction time

**DISADVANTAGES:**

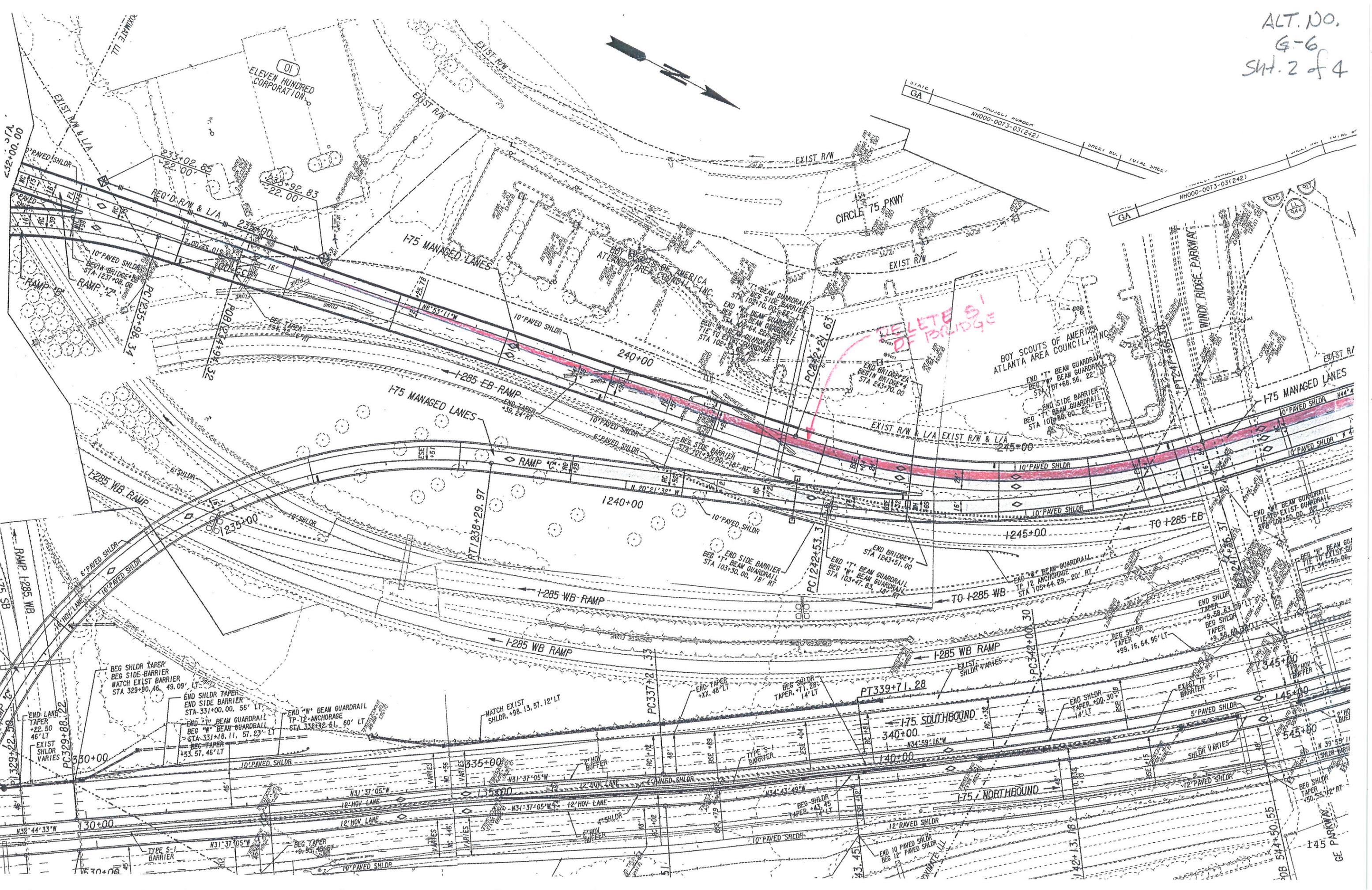
- A traffic analysis is needed to confirm the that traffic volumes will support the lane reductions

**DISCUSSION:**

In the morning hours, only one lane is provided for managed lane traffic to proceed south to I-285 westbound via Ramp Z and I-285 eastbound via Ramp B. In the evening, there will only be traffic on Bridge 2A from Ramp Z, I-285 eastbound, which will be minimal and one lane should suffice. With traffic from I-285 eastbound limited to one lane, traffic from Ramp C can merge in by providing a two-lane section. These two lanes can merge into one lane prior to where Ramp H from I-75 northbound merges in.

A traffic analysis will have to be performed to verify the implementability of this suggestion.

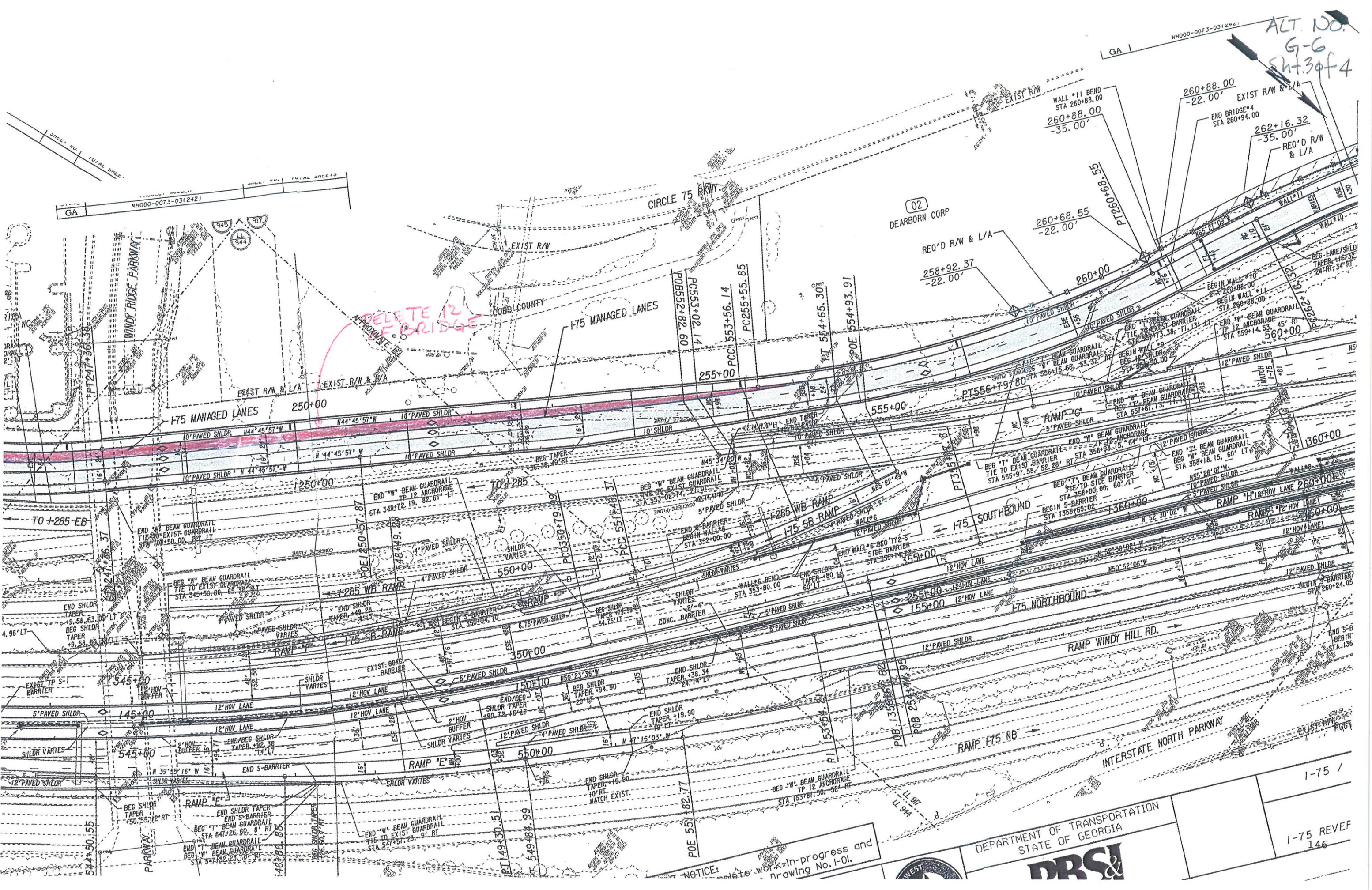
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 6,604,000	—	\$ 6,604,000
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS (Original minus Alternative)	\$ 6,604,000	—	\$ 6,604,000



STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	RH000-0073-03(242)		

DELETE BRIDGE

Engineering notes and labels on the drawing include:  
- "I-285 EB RAMP", "I-285 WB RAMP", "I-75 SOUTHBOUND", "I-75 NORTHBOUND"  
- Stationing: 235+00, 240+00, 245+00, 250+00, 255+00, 330+00, 335+00, 340+00, 345+00, 350+00, 355+00, 440+00, 445+00, 450+00, 455+00, 540+00, 545+00, 550+00  
- "10' PAVED SHLDR", "6' SHLDR", "12' HOV LANE", "TYPE S-1 BARRIER"  
- "END SIDE BARRIER", "END TAPER", "END BRIDGE", "END SHLDR TAPER", "BEG SHLDR TAPER", "BEG SIDE BARRIER", "BEG TAPER", "BEG 'W' BEAM GUARDRAIL", "BEG 'E' BEAM GUARDRAIL", "BEG 'S' BEAM GUARDRAIL", "BEG 'N' BEAM GUARDRAIL", "BEG 'W' BEAM GUARDRAIL", "BEG 'E' BEAM GUARDRAIL", "BEG 'S' BEAM GUARDRAIL", "BEG 'N' BEAM GUARDRAIL"  
- "PC 1235+98.34", "PT 1238+29.97", "PC 1242+53.3", "PT 1243+51.00", "PC 1247+36.37", "PT 1248+36.37", "PC 1252+00.30", "PT 1253+00.30", "PC 339+71.28", "PT 340+00.00", "PC 342+00.30", "PT 343+00.30", "PC 347+00.30", "PT 348+00.30", "PC 352+00.30", "PT 353+00.30", "PC 357+02.3", "PT 358+02.3", "PC 362+00.30", "PT 363+00.30", "PC 368+00.30", "PT 369+00.30", "PC 374+00.30", "PT 375+00.30", "PC 380+00.30", "PT 381+00.30", "PC 386+00.30", "PT 387+00.30", "PC 392+00.30", "PT 393+00.30", "PC 398+00.30", "PT 399+00.30", "PC 404+00.30", "PT 405+00.30", "PC 410+00.30", "PT 411+00.30", "PC 416+00.30", "PT 417+00.30", "PC 422+00.30", "PT 423+00.30", "PC 428+00.30", "PT 429+00.30", "PC 434+00.30", "PT 435+00.30", "PC 440+00.30", "PT 441+00.30", "PC 446+00.30", "PT 447+00.30", "PC 452+00.30", "PT 453+00.30", "PC 458+00.30", "PT 459+00.30", "PC 464+00.30", "PT 465+00.30", "PC 470+00.30", "PT 471+00.30", "PC 476+00.30", "PT 477+00.30", "PC 482+00.30", "PT 483+00.30", "PC 488+00.30", "PT 489+00.30", 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SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)

NOTICE: State work in-progress and drawing No. I-01.

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA



I-75 /  
I-75 REVEF  
146



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## PROJECT DESCRIPTION

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The subjects of the VE study were the following projects:

Project No.:	NH000-0073-03(242)	Cobb County
I-75 Reversible Lanes		
Project No.:	NH000-0575-01(028)	Cobb/Cherokee County
I-575 Reversible Lanes		
Project No.:	CSNHS-0008-00(256)	Cobb/Cherokee County
PI Nos.:	714130; 0008256; 713640; 0001919; 0006417; 0006418; 0006419	

These projects will construct Managed, Reversible Lanes along I-75 from the I-285 interchange north of the City of Atlanta north to Hickory Grove Road in Cobb County and along I-575 from the I-75 interchange in Cobb County north to Sixes Road in Cherokee County. There will be two reversible lanes on I-75 starting at the I-75 HOV lanes at the I-285 interchange. The northbound and southbound HOV lanes will merge into one lane north of the interchange and bridge over the I-75 southbound lanes to the west side of I-75. These will merge into the lanes leading to and from I-285.

Ramps to and from I-285 eastbound and westbound will merge into one lane and then meet with the I-75 lane to form the new two-lane section that will proceed north. Ramp C will start at the I-285 westbound lanes, bridge over I-75 and curve to the north over the I-285 ramp lanes to connect with a combined ramp from the managed lanes to I-285 eastbound and westbound, Ramps B and Z.

The I-75 managed lanes roadway will consist of two, 12-ft.-wide lanes, a 10-ft.-wide shoulder on the west side and a 4-ft.-wide shoulder on the east side. The two managed lanes will bridge over the I-75/Windy Hill Road interchange, return to an at-grade section and then bridge over Terrill Mill Road. On and off ramps to the managed lanes will be provided at Terrill Mill Road. The managed lanes will return to grade level and continue north, bridging over the south portion of Rottenwood Creek and then the Delk Road interchange on one continuous bridge. North of the I-75 southbound off-ramp to Delk Road, the managed lanes will again return to grade level. The road will continue north and bridge over the north portion of Rottenwood Creek and the wetland areas further north.

After returning to grade, the roadway will rise up again to bridge over more wetlands and then South Marietta Parkway, moving slightly west at the interchange and then back east to be alongside I-75 again. The roadway will return to grade level north of the interchange and continue north before bridging over SR 120/Roswell Road where exit and entry ramps to the managed lanes will be constructed. The roadway continues on a bridge structure over Gresham Road and the ramp from North Marietta Parkway to I-75 southbound, returns to an embankment section and then bridges over North Marietta Parkway interchange and then the I-75 southbound exit ramp to North Marietta Parkway. From north of the exit ramp, it proceeds at grade under Allgood Road and further north to where the Georgia Northeastern Railroad Spur parallels I-75.

From this point, the roadway rises up on a bridge structure which continues across the Georgia Northeastern Railroad and the Canton Road Connector/Hwy 5 interchange; moving slightly west as it crosses the interchange. It continues north of the interchange on a bridge structure and crosses into

the I-75 median where it returns to grade until the I-575 interchange. At the interchange, one lane turns due north and crosses I-75 northbound to become the I-575 reversible lane. The other lane continues north in the I-75 median adjacent to the northbound lanes.

The I-75 managed lane is in the median adjacent to the northbound I-75 general purpose lanes. The lane will be 12 ft. wide with a 10-ft.-wide shoulder on the inside and a 4-ft.-wide shoulder adjacent to a concrete barrier separating it from the general purpose lanes. This lane bridges over Barrett Parkway, a stream, Big Shanty Road, Chastain Road, Barrett Lakes Boulevard, Shiloh Road, and Wade Green Road. Further north it proceeds under Hickory Grove Road where it splits to connect to the general purpose I-75 northbound and southbound lanes.

The I-575 managed lane is in the median adjacent to the northbound I-575 general purpose lanes. The lane will be 12 ft. wide with a 10-ft.-wide shoulder on the inside and a 4-ft.-wide shoulder adjacent to a concrete barrier separating it from the general purpose lanes. An entry ramp from the I-575 southbound lanes is provided south of the Barrett Parkway bridge. Emergency exit and entry points are provided about every one-half mile. An exit to I-575 northbound is provided just north of the Barrett Parkway bridge. Bridge widenings are provided over creeks, Big Shanty Road, Chastain Road, N. Booth Road, Bells Ferry Road, Shallowford Road, Dupree Road, Town Lake Parkway, Old Pope Mill Road, and Altoona Lake. An access ramp is provided from I-575 southbound to the managed lane south of Sixes Road, the northern terminus of the project.

The bridges will be constructed using precast, prestressed concrete girders except for the ramps at the I-75/I-285 interchange where curved steel girders will be used. A combination of standard column bent piers, hammerhead piers and straddle bents will be used to support the bridges based on the configuration of the site where the bridges are located. Most retaining walls will be mechanically stabilized embankment walls except in cut areas where they are adjacent to existing highways or other structures. In these instances, tie-back walls will be used.

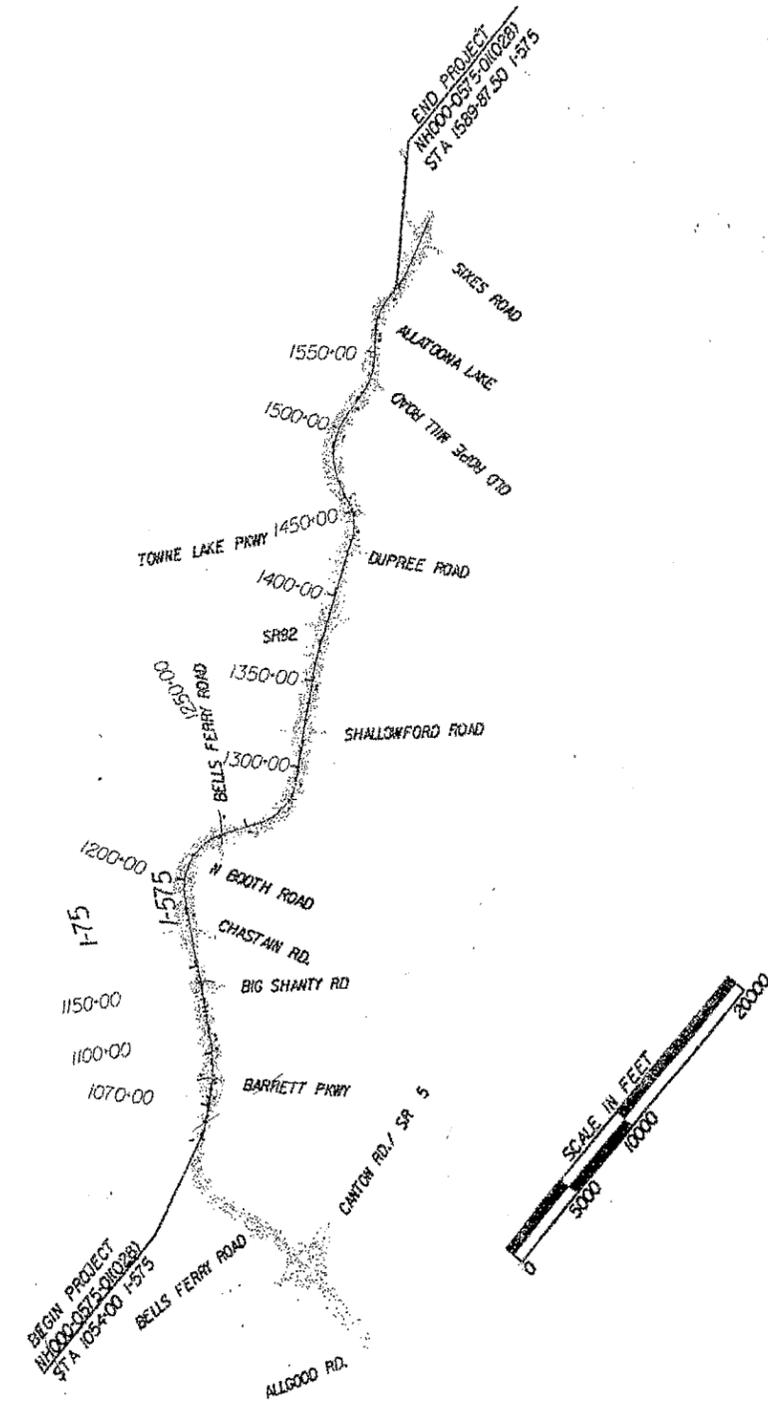
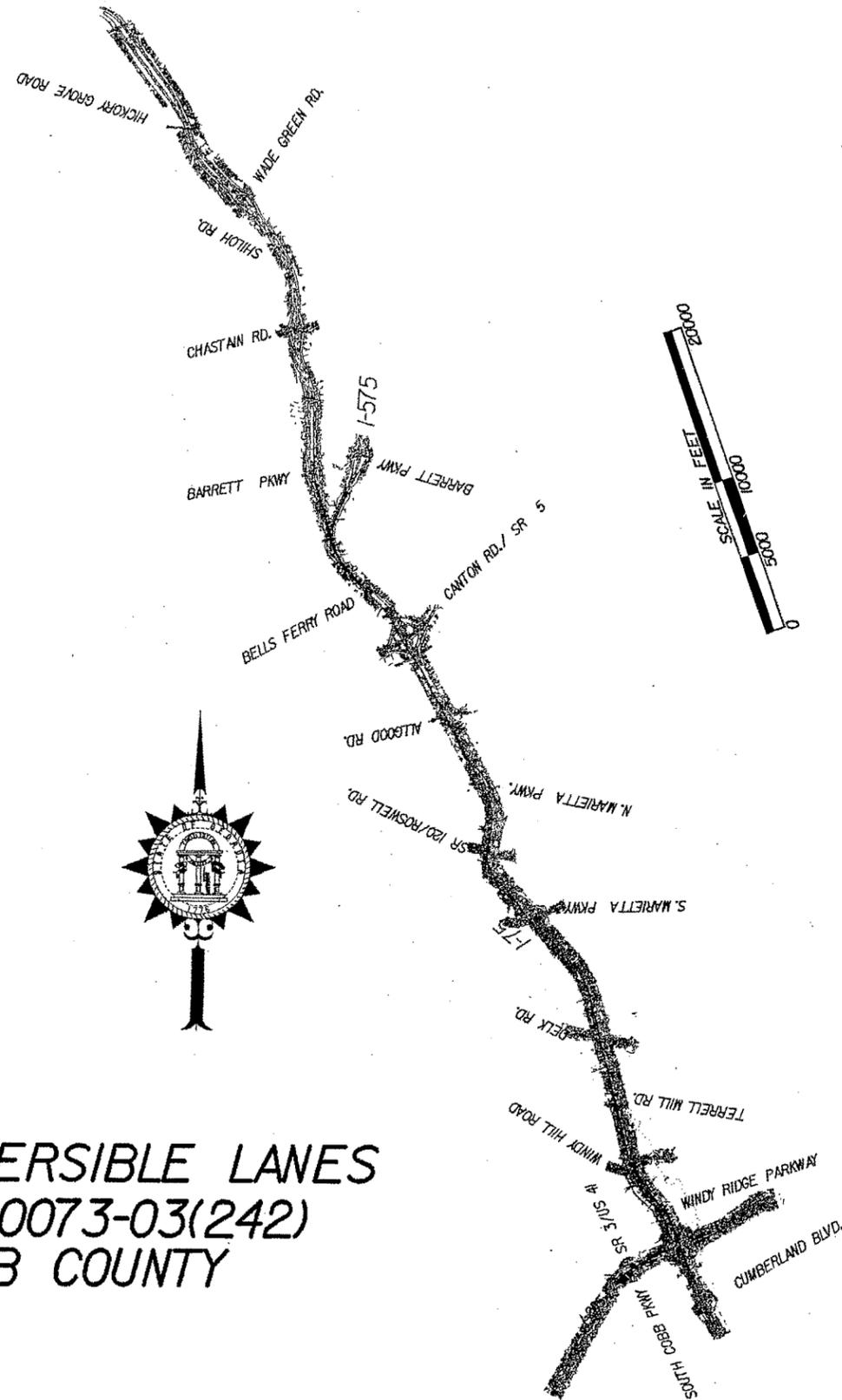
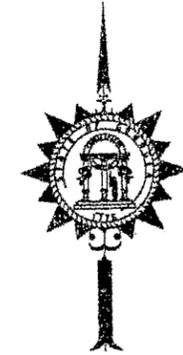
The pavement structure will be 12 in. of concrete over a 3-in.-thick asphalt concrete base coarse on top of the graded aggregate base. Existing culverts will be lengthened to accommodate the widened roadway section where required.

Also included in the project are new signs, both fixed and dynamic message signs, new traffic signals at the ramp termini, sound walls, utility relocations, lighting, fencing, and pavement markings.

The project is estimated to cost about \$1.05 billion. It will be procured using a design-build-operate-maintain-finance contract with the project being turned over to the State after 50 years. Electronic toll facilities will be erected along the route to identify users having transponders in their vehicles or pictures taken of their license plates in order to collect tolls. Tolls will vary from \$.25/mile to \$1.00/mile depending upon traffic conditions. High occupancy vehicles with three or more persons will be allowed to use the managed lanes free of charge.

Diagrams of the project follow.

**I-575 REVERSIBLE LANES  
NH000-0575-01(028)  
COBB/CHEROKEE COUNTIES**



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## VALUE ANALYSIS AND CONCLUSIONS

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### GENERAL

This section describes the value analysis (VA) procedure used during the VE study conducted for the GDOT by Lewis & Zimmerman Associates, Inc. on the I-75 Reversible Lanes project, NH000-0073-03(242) (P.I. No. 714130), in Cobb County; and I-575 Reversible Lanes, NH000-0575-01(028) (P.I. No. 713640), in Cobb and Cherokee Counties. The workshop was performed at the preliminary design completion stage. Georgia Transportation Partners (GTP), a joint venture of Bechtel Infrastructure Corporation and Kiewit Southern Corporation presented an innovative proposal to GDOT for transportation improvements in the Northwest Corridor under the Public Private Initiatives program. As a result of this proposal, a GTP/GDOT concept emerged to build reversible lanes on I-75 and I-575 to relieve traffic congestion. This concept was developed to the preliminary design stage by GTP and this information was provided to the VE team to use as the basis of the VE study.

A systematic approach was used in the VE study, which was divided into three parts: (1) Preparation Effort, (2) Workshop Effort, and (3) Post-Workshop Effort. A task flow diagram outlining each of the procedures included in the VE study is attached for reference.

Following this description of the VA procedure, separate narratives and supporting documentation identify the following:

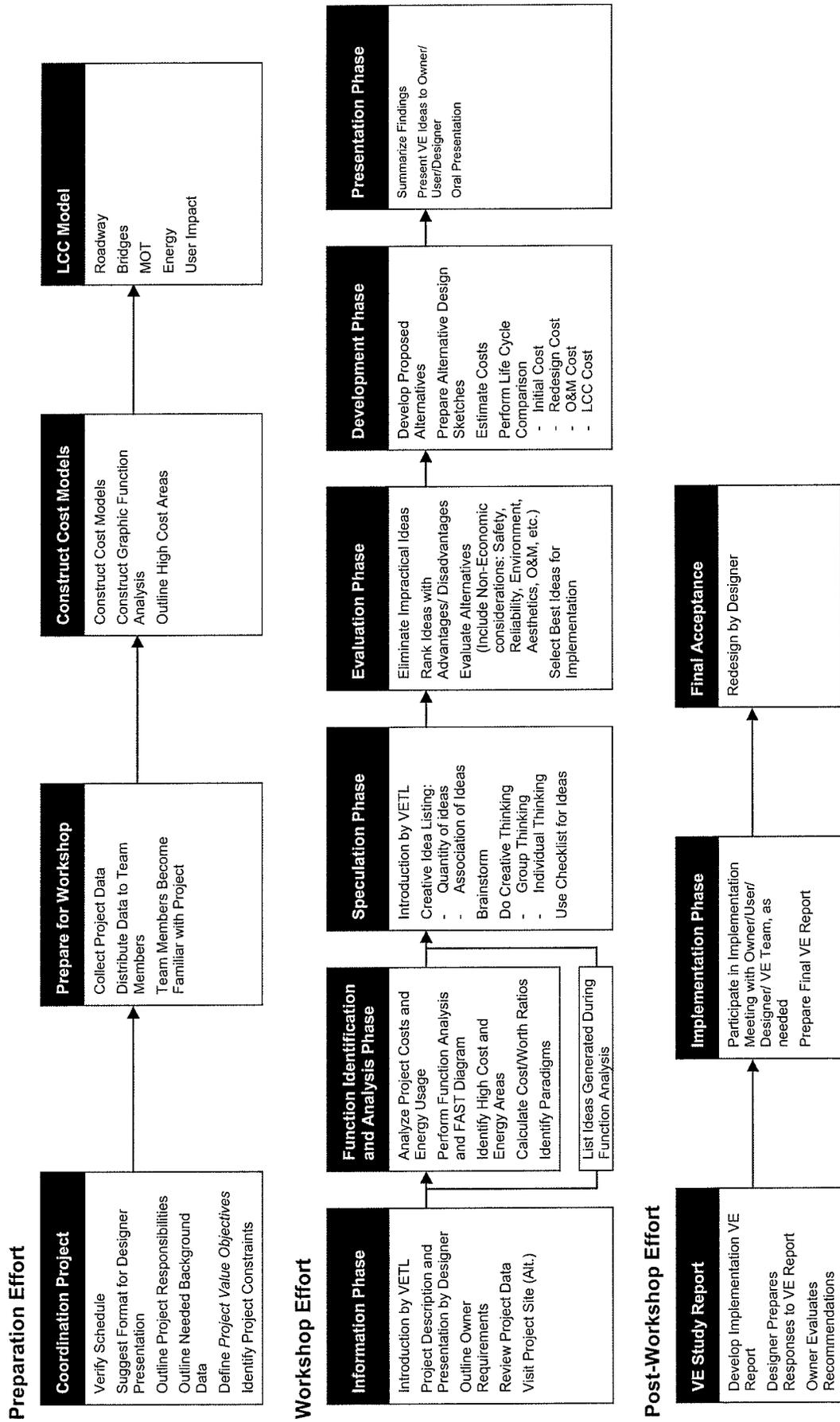
- VE workshop participants
- Economic data
- Cost model
- Function analysis
- Creative ideas and evaluations

### PREPARATION EFFORT

Preparation for the workshop consisted of scheduling workshop participants and tasks and gathering necessary project documents for team members to review before attending the workshop. Documents such as those listed below were used as the basis for generating VE alternatives and for determining the cost implications of the selected VE alternatives:

- Northwest I-75/I-575 Corridor Technical Concept Report, dated June 26, 2009, prepared by Georgia Transportation Partners
- I-75 and I-575 Crash Analysis, provided by John Hancock
- Pavement Evaluation Report I-575 from Barrett Parkway to Sixes Road Northwest Corridor Project, dated March 4, 2008, prepared by Willmer Engineering Inc.
- ROW Estimate Northwest Corridor I-75/I-575 Reversible Alternative Project Termini: From Windy Ridge Parkway to Dickson Ct., dated 02/12/09

# Value Engineering Study Task Flow Diagram



- Reversible Lanes 2008 Quantity Summary and Reversible Two Lane Option Cost Summary, prepared by Georgia Transportation Partners
- Bridge Matrix Preliminary Concept Reversible Alternative, prepared by Georgia Transportation Partners
- I-75 Reversible Lane – Outside Wall Matrix, prepared by Georgia Transportation Partners
- Existing Bridge Plans
  - Northbound Lane I-75 over Roberts Road
  - Southbound Lane I-75 over Roberts Road
  - Mill Green Parkway over Rottenwood Creek
  - I-285 Westbound C/D over Mill Green Parkway and Rottenwood Creek
  - Ramp A over Mill Green Parkway and Rottenwood Creek
  - Windy Hill Reliever Bridge No. 1
  - Bridge No. 9 Widening of I-75 over M-9020 (Bells Ferry Road)
- Georgia Transportation Partners – 25226-017-GEO-00001, Northwest Corridor Project: I-75 Reversible Lanes Bridge Foundation Investigations for 41 bridges

Information relating to the project’s purpose and need, owner concerns, project stakeholder concerns, design criteria, project constraints, funding sources and availability, regulatory agency approval requirements, and the project’s schedule and costs is very important as it provides the VE team with insight about how the project has progressed to its current state.

Project cost information provided by the designers is used by the VE team as the basis for a comparative analysis with similar projects. To prepare for this exercise, the VE team leader used the cost estimate prepared by GTP to develop a cost model for the project. The model was used to distribute the total project cost among the various elements of the project. The VE team used this model to identify the high-cost elements that drive the project and the element providing little or no value so that the team could focus on reducing or eliminating their impact.

## **VALUE ENGINEERING WORKSHOP EFFORT**

The VE workshop was a three and one-half-day effort beginning with an orientation/kickoff meeting on Monday, December 7, 2009, and concluding with the final VE Presentation on Friday morning, December 11, 2009. During the workshop, the VE Job Plan was followed in compliance with the U.S. Federal Highway Administration guidelines for conducting a VE study. The Job Plan guided the search for alternatives to mitigate or eliminate high-cost drivers, secondary functions providing little or no value, and potential project risks. Alternatives to specifically address the owner’s project concerns and enhance value by improving operations, reducing maintenance requirements, enhancing constructability, and providing missing functions were also considered. The Job Plan includes six phases:

- Information Phase
- Function Identification and Analysis Phase
- Creative/Speculation Phase
- Evaluation of Creative Ideas Phase
- Alternative Development Phase
- Presentation Phase

## Information Phase

At the beginning of the study, the decisions that have influenced the project's design and proposed construction methods have to be reviewed and understood. For this reason, the workshop began with a presentation of the project by GDOT and GTP to the team. The presentation highlighted the information provided in the documentation reviewed by the VE team before the workshop and expanded on it to include a history of the project's development and any underlying influences that caused the design to develop to its current state. During this presentation, VE team members were given the opportunity to ask questions and obtain clarification about the information provided.

## Function Identification and Analysis Phase

Having gained some information on the project, the VE team proceeded to define the functions provided by the project, identifying the costs to provide these functions, and determining whether the value provided by the functions has been optimized. Function analysis is a means of evaluating a project to see if the expenditures actually perform the requirements of the project or if there are disproportionate amounts of money spent on support functions. Elements performing support functions add cost to the project but have a relatively low worth to the basic function.

Function is defined as the intended use of a physical or process element. The team attempted to identify functions in the simplest manner using measurable noun/verb word combinations. To accomplish this, the team first looked at the project in its entirety and randomly listed its functions, which were recorded on Random Function Analysis Worksheets (provided in the Function Identification and Analysis section). Then the individual function(s) of the major components of the project depicted on the cost models were identified.

After identifying the functions, the team classified the functions according to the following:

<u>Abbreviation</u>	<u>Type of Function</u>	<u>Definition</u>
HO	Higher Order	The primary reason the project is being considered or project goal
B	Basic	A function that must occur for the project to meet its higher order functions
S	Secondary	A function that occurs because of the concept or process selected and may or may not be necessary
R/S	Required Secondary	A secondary function that may not be necessary to perform the basic function but must be included to satisfy other requirements or the project cannot proceed
G	Goal	Secondary goal of the project
O	Objective	Criteria to be met
LO	Lower Order	A function that serves as a project input

Higher order and basic functions provide value, while secondary functions tend to reduce value. The goal of the next job phase is to reduce the impact of secondary functions and thereby enhance project value.

To further clarify the impact of the various functions, the team assigned costs to provide the functions or group of functions indicated by a specific project element using the cost estimate and cost models. Where possible, they seek to find the lowest cost, or worth, to perform the function. This is accomplished using published data from other sources or team knowledge obtained from working on other similar projects to establish cost goals and then comparing them to the current costs. By identifying the cost and worth of a function or group of functions, cost/worth ratios were calculated. Cost/worth ratios greater than one indicated that less than optimum value was being provided. Those project functions or elements with high cost/worth ratios became prime targets for value improvement.

As well as looking at areas with high cost/worth ratios, the team used the cost models previously prepared to seek out the areas where most of the project funds are being applied. Because of the absolute magnitude of these high-cost elements or functions, they also became initial targets for value enhancement.

Overall, these exercises stimulated the VE team members to focus on apparently low value areas and initially channel their creative idea development in these places.

### **Creative/Speculation Phase**

This VE study phase involved the creation and listing of ideas. Starting with the functions or project elements with high cost/worth ratios, a high absolute cost compared to other elements in the project, and secondary functions providing little or no value and using the classic brainstorming technique, the VE team began to generate as many ideas as possible to provide the necessary functions at a lower total life cycle cost, or to improve the quality of the project. Ideas for improving operation and maintenance, reducing project risk, and simplifying constructability were also encouraged. At this stage of the process, the VE team was looking for a large quantity of ideas and free association of ideas. A Creative Idea Listing worksheet was generated and organized by the function or project element being addressed.

GDOT and the eventual construction team may wish to review these creative lists since they may contain ideas that were not pursued by the VE team but can be further evaluated for potential use in the design.

### **Evaluation Phase**

Since the goal of the Creative/Speculation Phase was to conceive as many ideas as possible without regard for technical merit or applicability to the project goals, the Evaluation Phase focused on identifying those ideas that do respond to the project value objectives and are worthy of additional research and development before being presented to the owner. The selection process consisted of the VE team evaluating the ideas originated during the Creative/Speculation Phase based on GDOT's value objectives identified through conversations during the opening presentation. Based on the team's understanding of the owner's value objectives, each idea was compared with the present design concept, and the advantages and disadvantages of each idea were discussed. How well an idea met the design criteria was also reviewed.

Based on the results of these reviews, the VE team rated the idea by consensus using a scale of 1 to 5, with 5 or 4 indicating an idea with the greatest potential to be technically sound and provide cost savings or improvements in other areas of the project, 3 indicating an idea that provides marginal value

but could be used if the project was having budget problems, 2 indicating an idea with a major technical flaw, and 1 indicating an idea that does not respond to project requirements. Generally, ideas rated 4 and 5 are pursued in the next phase and presented to the owner during the Presentation Phase.

The team also used the designation “DS” to indicate a design suggestion, which is an idea that may not have specific quantifiable cost savings but may reduce project risk, improve constructability, help to minimize claims, enhance operability, ease maintenance, reduce schedule time, or enhance project value in other ways. Design suggestions could also increase a project’s cost but provide value in areas not currently addressed. These are also developed in the next phase of the VE process.

### **Development Phase**

In this phase, each highly rated idea was expanded into a workable solution designated as a VE alternative. The development consisted of describing the current design and the alternative solution, preparing a life cycle cost comparison where applicable, describing the advantages and disadvantages of the proposed alternative solution, and writing a brief narrative to compare the original design to the proposed change and provide a rationale for implementing the idea into the design. Sketches and design calculations, where appropriate, were also prepared in this part of the study. The VE alternatives are included in Section Two of this report.

Design suggestions include the same information as the alternatives except that no cost analysis is performed. They too are included in Section Two.

### **Presentation Phase**

The goals of the last phase of the workshop were to summarize the results of the study, to prepare draft Summary of Potential Cost Saving worksheets to hand out at the presentation, and to present the key VE alternatives and design suggestions to GDOT and the GTP design team. The presentation was held on Friday morning, December 11, 2009, at the GDOT Headquarters office in Atlanta, Georgia. The purpose of the meeting was to provide the attendees with an overview of the suggestions for value enhancement resulting from the VE study and afford them the opportunity to ask questions to clarify specific aspects of the alternatives presented. Procedures for implementing the results of the study were discussed, and arrangements were made for the reviewers of the VE report to contact the VE team in order to obtain further clarifications, if necessary. Draft copies of the Summary of Potential Cost Savings worksheets were given to the attendees to facilitate a timely review and speedy implementation of the selected ideas.

### **POST-WORKSHOP EFFORT**

The post-workshop portion of the VE study consisted of the preparation of this VE Study Report. Personnel from GDOT will analyze each alternative and prepare a short response, recommending incorporation of the alternative into the project, offering modifications before implementation, or presenting reasons for rejection. LZA is available at your convenience as you review the alternatives. Please do not hesitate to call on us for clarification or further information as you consider an implementation approach.

Upon completing their reviews, GDOT will decide which alternatives to implement.

## VALUE ENGINEERING WORKSHOP PARTICIPANTS

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The VE team was organized to provide specific expertise in the unique project elements involved with the I-75 Reversible Lanes and I-575 Reversible Lanes project. The multidisciplinary team comprised professionals with highway design, bridge design and construction experience and a working knowledge of VE procedures. The following lists the VE team members:

<u>Participant</u>	<u>Specialization</u>	<u>Affiliation</u>
Joe Leoni, PE	Highway Design	ARCADIS US, Inc.
John Tiernan, PE	Bridge Design	ARCADIS US, Inc.
Larry Prescott, PE	Bridge Engineer	HNTB Corporation
Paresh J. Parikh	Constructability	Delon Hampton Associates
Harley Griffin	Highway Design	Delon Hampton Associates
Howard B. Greenfield, PE, CVS	VE Team Leader	Lewis & Zimmerman Associates

### DESIGNER'S PRESENTATION

An overview of the project was presented on Monday, December 7, 2009, by representatives from GDOT and the GTP design team. The purpose of this meeting, in addition to being an integral part of the Information Phase of the VE study, was to bring the VE team up-to-speed regarding the overall project specifics. Additionally, the meeting afforded the owner and design team the opportunity to highlight in greater detail those areas of the project requiring additional or special attention. An attendance list for the meeting is attached.

### VALUE ENGINEERING TEAM'S PRESENTATION

A VE presentation was conducted by the VE team on Friday morning, December 11, 2009 at the GDOT Headquarters office in Atlanta, Georgia to review VE alternatives with GDOT, GTP and Federal Highway Administration representatives. Copies of the Draft Summary of Potential Cost Savings worksheet were provided to the attendees. Attendees checked off their names on the attendance list from the opening presentation.

## VE STUDY SIGN-IN SHEET

Project No.: NH000-0073-03(242) CSNHS-0008-00(256) County: Cobb/Cherokee PI No.:714130, 0008256, 713640, 0001919, Date: Dec. 7-11, 2009  
 NH000-0575-01(028) NHS00-0001-00(919) CSNHS-0006-00(417)(418)(419) 0006417, 0006418, 0006419

1	5	NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
✓		Lisa L. Myers	00244168	Engineering Services	404-631-1770	lmyers@dot.ga.gov
✓		Matt Sanders	00284154	Engineering Services	404-631-1752	msanders@dot.ga.gov
✓		James K. Magnus	00208161	Construction	404-631-1971	jmagnus@dot.ga.gov
✓		Ken Werho	00258268	Traffic Operations	404-635-8144	kwerho@dot.ga.gov
✓		Robert Moses		Parsons Brinckerhoff	404-364-2674	moses@pbworld.com
✓		Roger Palmer		Parsons Brinckerhoff	404-364-2658	palmer@pbworld.com
✓		Howard Greenfield		Lewis & Zimmerman	301-984-9590	hgreenfield@lza.com
✓		John P. Tiernan		ARCADIS	770-431-8666	jtiernan@arcadis-us.com
✓		Harley Griffin		Delon Hampton	404-524-3030	hgriffin@delonhampton.com
✓		Paresh J. Parikh		Delon Hampton	404-524-3030	pparikh@delonhampton.com
✓		Joe Leoni		ARCADIS	770-431-8666	Joe.leoni@arcadis-us.com
✓		Laurie Reed		HNTB	404-946-5722	llreed@hntb.com
✓		Kenny Beckwork	00284105	DO7	770-307-3605	kbeckwork@dot.ga.gov
✓		Jonathan Reid		Parsons Brinckerhoff	404-364-5225	reid@pbworld.com
✓		Larry Prescott		HNTB	404-946-5743	lprescott@hntb.com
✓		Mindy Roberson		FHWA	404-562-3652	Melinda.roberson@fhwa.dot.gov
✓		Chetna Dixon		FHWA	404-562-3655	Chetna.dixon@fhwa.dot.gov
✓		John Hancock	0031405	IPD	404-631-1711	jhancock@dot.ga.gov
✓		Keisha Jackson	000702451	GDOT/OEL	404-631-1160	keijackson@dot.ga.gov
✓		Bill Duvall	00299945	GDOT/Bridge	404-631-1883	dbuwall@dot.ga.gov
✓		Mike Moseley		PBSJ	770-933-0280	mmoseley@pbsj.com

✓ Check all that apply

24 Attended Project Overview (Day 1)

16 Attended Project Presentation (Day 4)



## ECONOMIC DATA

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The comparisons of life cycle costs between the VE alternatives and the current design solutions were performed on the basis of discounted present worth. To accomplish this, the VE team developed economic criteria to use in its calculations based on information gathered from GDOT and the design team. The following parameters were used when calculating discounted present worth:

Year of Analysis:	2009
Construction Start Date:	Late 2010
Construction Completion Date:	Unknown
Planning Period (n):	20

When computing capital costs, direct material, labor, equipment and escalation costs are marked up using 4% for design costs.

## **COST MODEL**

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The VE team prepared a Pareto Chart, or Cost Histogram, for the project that follows this page. This Cost Histogram displays the major construction elements identified in the cost estimate prepared by the designer in descending order of magnitude and thus identifies the high cost areas in the project. The high cost elements provide the VE team with one focus for its work during the study.

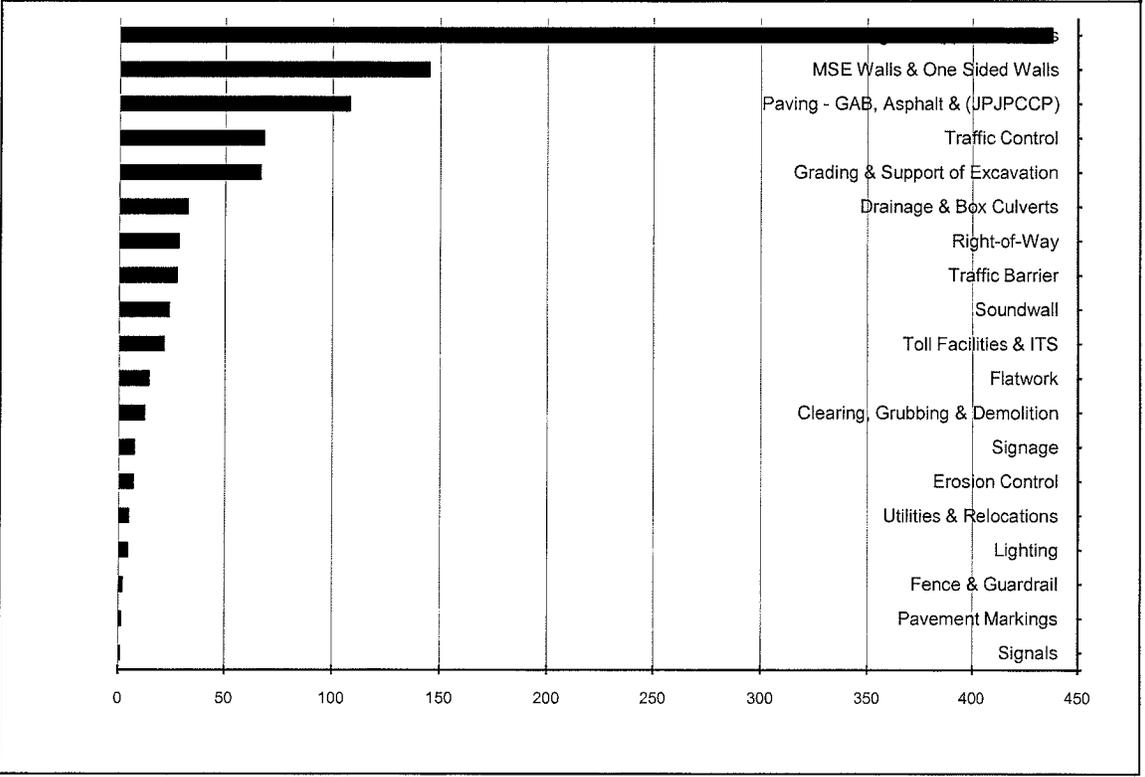
The bridge, retaining wall and pavement costs represent 68% of the project's cost. Thus the team focused its efforts on reducing the impacts of these elements.

# COST HISTOGRAM

**PROJECT: I-75 and I-575 Reversible Lanes**

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Bridges & Approach Slabs	437,811,937	43.50%	43.50%
MSE Walls & One Sided Walls	144,731,842	14.38%	57.89%
Paving - GAB, Asphalt & (JPJCCP)	107,758,366	10.71%	68.59%
Traffic Control	67,625,659	6.72%	75.31%
Grading & Support of Excavation	66,131,803	6.57%	81.88%
Drainage & Box Culverts	32,012,937	3.18%	85.06%
Right-of-Way	27,835,117	2.77%	87.83%
Traffic Barrier	27,025,000	2.69%	90.52%
Soundwall	23,437,513	2.33%	92.84%
Toll Facilities & ITS	21,011,500	2.09%	94.93%
Flatwork	13,829,200	1.37%	96.31%
Clearing, Grubbing & Demolition	11,789,087	1.17%	97.48%
Signage	6,914,600	0.69%	98.17%
Erosion Control	6,618,398	0.66%	98.82%
Utilities & Relocations	4,469,913	0.44%	99.27%
Lighting	4,148,760	0.41%	99.68%
Fence & Guardrail	1,592,200	0.16%	99.84%
Pavement Markings	1,037,190	0.10%	99.94%
Signals	600,036	0.06%	100.00%

<b>Subtotal</b>	<b>\$ 1,006,381,058</b>	<b>100.00%</b>
<b>Design</b>	<b>\$ 38,620,000</b>	
<b>TOTAL</b>	<b>\$ 1,045,001,058</b>	<b>Comp Mark-up: 4%</b>



## FUNCTION ANALYSIS

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A function analysis was performed to (1) understand the project purpose and need, (2) define the requirements for each project element, (3) ensure a complete and thorough understanding by the VE team of the basic function(s) needed to attain the given project purpose and need, (4) identify other public goals, and (5) identify secondary functions that should be addressed by the VE team. The Random Function Analysis worksheet completed by the team for the project in its entirety and the various elements follow. Key functions include:

- Separate Traffic
- Connect Traffic
- Support Vehicles

# RANDOM FUNCTION ANALYSIS



PROJECT: <b>I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES</b>		SHEET NO.: <b>1 of 2</b>	
<i>NH000-0073-03(242), P.I. No. 714130</i>			
<i>Cobb County, GA</i>			
DESCRIPTION	FUNCTION		
	VERB	NOUN	KIND
<b>PROJECT</b>	Reduce	Congestion	HO
	Maintain	Level of Service	HO
	Generate	Revenue	B
	Separate	Traffic	B
	Charge	Users	B
	Add	Capacity	B
	Access	Side Roads	B
	Access	General Purpose Lanes	B
	Access	I-285	B
	Enhance	Quality of Life	B
	Maintain	Traffic	S
Bridges	\$339M	Connect	Roads
		Avoid	Wetlands
	\$\$\$	Separate	Traffic
		Avoid	Railroad
Walls	\$137M	Reduce	Right-of-Way
		Separate	Traffic
		Avoid	Wetland
Paving	\$117M	Support	Vehicles
Traffic Barrier	\$49M	Separate	Traffic
		Redirect	Vehicles
Toll Facility	\$38M	Identify	Users
		Charge	Users
		Detect	Flow/Volume
Toll Facility (continued)		Set	Rates

Function defined as:	Action Verb	Kind:	B = Basic	HO = Higher Order
	Measurable Noun		S = Secondary	LO = Lower Order
			RS = Required Secondary	



## CREATIVE IDEA LISTING AND EVALUATION OF IDEAS

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During the Creative/Speculation Phase, numerous ideas were generated for the project using conventional brainstorming techniques. These ideas were recorded and are shown with their corresponding ranking on the attached Creative Idea Listing Worksheets. For the convenience of tracking an idea through the VA process, the ideas were grouped into the following project elements and numbered according to the order in which they were conceived. The following letter prefixes were used to identify the project elements.

<b>PROJECT ELEMENT</b>	<b>PREFIX</b>
Traffic Barriers	T
Bridges	B
Walls	W
Pavement	P
I-575 Managed Lanes	575
General	G

The ideas were ranked on a qualitative scale of 1 to 5 on how well the VE team believed the idea met the project purpose and need criteria. To assist the team in evaluating the creative ideas, the advantages and disadvantages of each new idea compared to the existing design solution were discussed based on GDOT's value objectives for the project obtained through conversations during the project kick-off meeting. The following are the top value objectives for this project:

- Save construction costs
- Simplify construction
- Do not impact the project's schedule
- Reduce impact on maintenance of traffic during construction
- Enhance the purpose and need of the project
- Enhance the safety of the completed facility
- Reduce environmental impacts

After discussing each idea, the team evaluated the ideas by consensus. This process produced 25 ideas rated 4 or 5 or design suggestions to research and develop into formal VE alternatives to be included in Section Two of the report. Highly rated ideas that were not developed further and presented in Section Two may have been combined with another related idea or discarded as a result of additional research indicating the concept as not being cost-effective or technically feasible. The reader is encouraged to review the Creative Idea Listing and Evaluation worksheet since it may suggest additional ideas that can be applied to the design.

# CREATIVE IDEA LISTING



PROJECT:	<b>I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES</b> <i>NH000-0073-03(242), P.I. No. 714130</i> <i>Cobb County, GA</i>	SHEET NO.:	1 of 2
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NO.	IDEA DESCRIPTION	RATING
<b>TRAFFIC BARRIERS</b>		
T-1	Use cable barrier in lieu of concrete barriers	2
<b>PAVING</b>		
P-1	On I-75 reversible lanes where there are two lanes use 11-ft.-wide lane on 10-ft.-wide shoulder side	4
P-2	Use thinner pavement section for shoulders	2
P-3	Use soil cement in lieu of asphalt base	4
P-4	Delete asphalt base	4
<b>BRIDGES</b>		
B-1	Lower profile of Bridge Nos. 12 and 13	4
B-2	Extend bridge on Gresham Road and place managed lanes at grade – eliminate Bridge No. 19	5
B-3	Increase span lengths for Bridge No. 13 and use spliced girders	4
B-4	Increase span lengths for Bridge No. 4	4
B-5	Straighten managed lanes at South Marietta Parkway and place at-grade and use braided ramp bridge	4
B-6	Have Bridge No. 4 go under Windy Ridge Parkway and delete Bridge No. 4	4
B-7	At Canton Road bring the bridge to the west of the interchange	3
B-8	Place managed lanes at grade at Delk Road and use braided ramps	2
B-9	Take managed lanes below the Dixon Road Bridge	1
B-10	Convert Bridge No. 18A to an embankment section	2
B-11	Modify the ramp between Gresham Road and Roswell Road (Bridge No. 19)	4
B-12	For Bridge No. 17 lengthen the north span	2
B-13	For Bridge No. 16 either expand or contract the bridge and mitigate wetlands	4
B-14	Mitigate wetlands and shorten Bridge No. 17	4
B-15	At Hickory Grove Road and I-75 use MSE walls and abutments in lieu of end spans	4

Rating: 1→2 = Not to be developed      3→4 = Varying degrees of development potential      5 = Most likely to be developed DS = Design suggestion                      ABD = Already being done
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# CREATIVE IDEA LISTING



PROJECT:	<b>I-75 REVERSIBLE LANES AND I-575 REVERSIBLE LANES</b> <i>NH000-0073-03(242), P.I. No. 714130</i> <i>Cobb County, GA</i>	SHEET NO.:	2 of 2
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NO.	IDEA DESCRIPTION	RATING
<b>BRIDGES (continued)</b>		
B-16	Retain and modify the existing bridge at Hickory Grove Road over I-75	3
B-17	Use a larger radius for Bridge No. 7 and shorten bridge	4
B-18	Shorten Bridge No. 2B and move curve north	4
<b>GENERAL</b>		
G-1	From south of the I-75/I-575 interchange, cross over to the east side and then connect back to the center of I-75 and I-575	5
G-2	Where possible provide a 4 ft. shoulder and a 12 ft. shoulder in lieu of two 10 ft. shoulders	4
G-3	At the north end of Bridge No. 4, expand to two lanes with a merge from Bridge No. 13	DS
G-4	Cross to the east side north of North Marietta Parkway	5
G-5	Cross to the east side north of North Marietta Parkway and add an access at Bells Ferry Road	DS
G-6	Delete three-lane section between Ramp Z and Ramp C merge	4
<b>WALLS</b>		
W-1	At Big Shanty Road and I-75 move the entry and exit ramps into the median to avoid the walls along I-75	4
W-2	Adjust the reversible lane profile between S. Marietta Parkway and Banberry Road	5
W-3	Adjust the reversible lane profile at Station 415	
<b>I-575</b>		
575-1	Move slip ramp at Hawkins Store Bridge north and reduce the bridge width	4
575-2	End the project just south of the Little River Bridge by shifting the slip ramp (and shorten ram) south	5

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