



# WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD

STP-8060(2), P.I. No. 351010 and  
STP-0005-00(749), P.I. No. 0005749  
City of Columbus, Muscogee County

## Value Engineering Report Design Development Stage

September 2007



*Design Team*  
Kisinger Campo and Associates Corporation

*Value Engineering Consultant*



**Lewis & Zimmerman Associates, Inc.**



Lewis & Zimmerman Associates, Inc.

Taking the Chance out of Change

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October 10, 2007

Ms. Lisa L. Myers  
Design Review Engineer Manager  
State of Georgia Department of Transportation, General Office  
No. 2 Capitol Square, Room 266  
Atlanta, Georgia 30334-1002

re: Project Numbers STP-8060(2), P. I. No. 351010 and STP-0005-00(749), P. I. No. 0005749  
Widening and Reconstruction of Whittlesey Road, Muscogee County  
Value Engineering Study Report

Dear Ms. Myers:

Lewis & Zimmerman Associates, Inc. is pleased to submit four hard copies and one electronic copy of the referenced value engineering study report. The objective of the VE study was to identify opportunities to improve safety and traffic flow in the corridor, while potentially reducing project costs.

Of concern to the VE team was the high cost of right-of-way, at more than 57% of the total project cost. Several alternatives seek to minimize the right-of-way required. GDOT is in the process of purchasing the right-of-way and this creates an urgency to review the findings of the VE study as soon as possible. A second concern was the higher than average accident rate, at almost nine times the statewide average. Other key alternatives developed during the VE study focused on increasing capacity and improving safety.

We thank you and your staff for your hospitality and for providing the information necessary for the VE team to generate creative, alternative solutions for this project. We are available to answer any questions you may have as you review this report and determine implementation.

Sincerely yours,

LEWIS & ZIMMERMAN ASSOCIATES, INC.

Luis M. Venegas, PE, CVS, FSAVE, LEED® AP  
Vice President

Attachment

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## **EXECUTIVE SUMMARY**

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### **INTRODUCTION**

This value engineering (VE) study report summarizes the events and results of the VE study conducted by Lewis & Zimmerman Associates, Inc. (LZA) for the Georgia Department of Transportation (GDOT). The subject of the study was the Widening and Reconstruction of Whittlesey Road, Project Nos. STP-8060(2), P. I. No. 351010 and STP-0005-00(740), P. I. No. 0005749, in Muscogee County, Georgia. The design development documents used as the basis for the study were prepared by the Kisinger Campo and Associates Corporation (KCA).

The VE workshop was conducted September 24-27, 2007 at GDOT's Atlanta offices under the guidelines of FHWA and SAVE International. The VE team comprised design and construction professionals with highway and VE experience.

### **PROJECT DESCRIPTION**

The primary project, STP-8060(2), P. I. No. 351010, is the widening and reconstruction of Whittlesey Road and US 27/SR 1/Veterans Parkway/Martha Berry Highway. The project begins on Whittlesey Road at Rollins Way and continues north and then east 1.089 miles to Veterans Parkway in the City of Columbus. Construction begins on Veterans Parkway at Gepca Drive/Frist Court and continues north across Whittlesey Road 0.515 miles. The project involves widening from two and three lanes on Whittlesey Road and five lanes on Veterans Parkway to four lanes urban curb and gutter section with a 20-foot raised median and turn lanes at intersections.

A secondary project, STP-0005-00(749), P. I. No. 0005749, similarly widens and reconstructs Whittlesey Road commencing at the intersection of Whittlesey Road and Bradley Park Drive and continues north to the beginning of the primary project on Whittlesey Road at Rollins Way, a distance of about 0.27 miles.

The probable cost of construction for STP-8060(2), P. I. No. 351010, based on the September 10, 2007, construction cost estimate prepared by KCA is \$36,269,679. This figure comprises \$13,915,450 for construction and \$22,254,229 for right-of-way. GDOT provided lump sum costs for STP-0005-00(749), P. I. No. 0005749 as \$3,770,826 for construction and \$1,541,000 for right-of-way, including markups. The grand total for the projects is \$17,686,275 in construction and \$23,895,229 in right-of-way.

### **CONCERNS AND OBJECTIVES**

The VE team's most significant concern was that right-of-way costs represent over 57% of the total cost of project. Another concern is that this corridor experiences higher than statewide average accident rates. GDOT is also concerned with the overall lack of funds to construct the State's entire highway program and is seeking implementable VE alternatives that reduce costs.

Therefore, the VE team sought to optimize the project to meet the objectives of improving safety and increasing capacity while looking for opportunities to reduce right-of-way requirements and improve the value of the project in other ways. Several areas of the project were explored to accomplish these goals, including the following:

- Design speed. Designing to 45 miles per hour (mph) may not be warranted as the anticipated traffic volumes in the future will preclude traveling much faster than 35 mph. There may be opportunities to reduce right-of-way takes with a lower design speed and narrower section.
- Sidewalks. Sidewalks will likely not be used heavily along Whittlesey Road and Veterans Parkway north of Whittlesey Road, especially considering the anticipated volume of vehicular traffic. Selectively eliminating sidewalks will reduce right-of-way requirements.

## **HIGHLIGHTS OF THE STUDY**

Some of the more salient alternatives developed by the VE team are described below. The Summary of Potential Cost Savings table follows this narrative and outlines all of the developed alternatives. Some alternatives are mutually exclusive or interrelated so the addition of all project cost savings does not equal total potential savings for the project. The fully-developed alternatives are detailed in the Study Results section of this report.

Since GDOT has begun the right-of-way acquisition process, any potential right-of-way savings described in this VE report should be reviewed as soon as possible.

To improve traffic flow and safety, Alt. Nos. 4 and 5 would either close-off access from Hamilton Park Drive onto Whittlesey Road or would only provide for right-in/right-out turning movements from Hamilton Park Drive onto Whittlesey Road. Almost \$310,000 could be saved by a complete close-off. Alt. Nos. 7 and 8 apply these same principles to Bradley Park Drive. The close-off here could save as much as \$1,300,000, and providing only right-in/right-out turning movements could save \$1,270,000.

The VE team explored various options to use a narrower median and reduce the sidewalks. For the median, potential savings range from \$1,800,000 up to \$5,200,000 for a 10-foot-wide median throughout the project. Retaining sidewalks only at the most residential areas and at the area serving the Hughston Orthopedic Hospital could save almost \$3,300,000 (Alt. No. 3). If more significant cost cuts are required, eliminating the sidewalks entirely could save about \$4,600,000 (Alt. No. 2). Finally, the shoulders could be prepared for future sidewalk paving and the actual paving portion of could be eliminated. This would save about \$550,000 (Alt. No. 6) and is common on academic campuses where final paths and walkways are not immediately apparent.

The greatest, and perhaps most controversial, cost savings could come from eliminating the entire west end of the project and improving the intersections at Whittlesey Road/Whiteville Parkway and Whittlesey Road/Bradley Park Drive. This provides a more direct route from the beginning of the project at Bradley Park Drive to the end of the project near Veterans Parkway and the business areas, and it uses the existing parkway while minimizing congestion on Bradley Park Drive from Whitesville Parkway to Whittlesey Road. Whittlesey Road adjacent to the car dealerships at the west end of the project would not be widened beyond the existing three-lane facility with a flush

median, as it appears the existing conditions do not warrant a major re-work. Furthermore, it also appears that Whitesville Parkway and Whittlesey Road combined can accommodate anticipated increase to traffic volumes without the additional re-work of Whittlesey Road. Saving for this reduction in work could reach \$13,500,000 and it is described in Alt. No. 9.



# SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: STP-8060(2), P. I. No. 351010 and STP-0005-00(749), P. I. No. 0005749 WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD <i>Muscogee County, Design Development Stage</i>						
PRESENT WORTH OF COST SAVINGS						
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
2	Eliminate all sidewalks	\$ 4,661,137	\$ -	\$ 4,661,137		\$ 4,661,137
3	Selectively retain sidewalk installations	\$ 3,481,770	\$ 160,143	\$ 3,321,627		\$ 3,321,627
4	Close off West Hamilton Park Drive	\$ 521,274	\$ 211,232	\$ 310,042		\$ 310,042
5	Allow right-in/right-out only at West Hamilton Park Drive	\$ 61,555	\$ 37,727	\$ 23,828		\$ 23,828
6	Delay sidewalk paving	\$ 557,470	\$ 3,504	\$ 553,966		\$ 553,966
7	Close off Bradley Park Drive at Whittlesey Road	\$ 1,381,060	\$ 80,386	\$ 1,300,674		\$ 1,300,674
8	Allow right-in/right-out only at Bradley Park Drive	\$ 1,352,207	\$ 81,070	\$ 1,271,137		\$ 1,271,137
9	Eliminate west end of the projects from Whitesville Parkway to Bradley Park Drive and improve the intersections at Whittlesey Road/Whitesville Road and Whittlesey Road/ Bradley Park Drive	\$ 15,830,587	\$ 2,286,180	\$ 13,544,407		\$ 13,544,407
11	If Alternative Nos. 4 and 7 are accepted, use a narrower median from Veterans Parkway to Whitesville Road	\$ 1,832,508	\$ -	\$ 1,832,508		\$ 1,832,508
13/14	Use a 14-ft. median throughout the project	\$ 3,216,666	\$ -	\$ 3,216,666		\$ 3,216,666
15	Use parapet retaining walls in lieu of gravity walls	\$ 910,937	\$ 742,574	\$ 168,363		\$ 168,363
17	Use a monolithic median pour where existing pavement is retained	\$ 264,658	\$ -	\$ 264,658		\$ 264,658
18	Use a precast arch in lieu of the dual box culverts	\$ 169,953	\$ 195,050	\$ (25,097)		\$ (25,097)
20	Incorporate Parcel No. 12 in the green space	\$ -	\$ 183,023	\$ (183,023)		\$ (183,023)
22	Raise the profile of the facility from the railroad crossing to Veterans Parkway	\$ 1,965,275	\$ 1,797,522	\$ 167,753		\$ 167,753
23	Use 10-ft. shoulders throughout the project where possible	\$ 5,340,465	\$ 183,023	\$ 5,157,442		\$ 5,157,442

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## STUDY RESULTS

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### INTRODUCTION

The results of a value engineering (VE) study represent the benefits that can be realized on the project by the owner, users and designer. The results will directly affect the project design and will require coordination between GDOT and the designer to determine the ultimate acceptance of each alternative.

### RESULTS OF THE STUDY

The VE team generated 23 ideas for change during the Function Analysis and Creative Idea phases of the workshop. The evaluation of these ideas was based upon their potential for capital cost savings, probability of acceptance, availability of information, adherence to universally accepted standards and procedures, life cycle cost efficiency, safety, maintainability, and constructability.

Of the 23 ideas generated, 20 were sufficiently rated to warrant further investigation. Continued research and development of these ideas yielded 17 alternatives for change with an impact on project cost and two ideas that show promise but were not fully-developed due to time constraints in the workshop. GDOT and the design team may want to explore these two ideas further:

- No. 12 Reduce superelevation from 6% to 4%
- No. 21 Increase the intersection radii from 35 ft. to 50 ft.

The developed alternatives are listed on the Summary of Potential Cost Savings table that follows and presented in detail in this report section. The alternatives are organized according to the order in which they were originally generated by the VE team during their function analysis creative sessions.

### EVALUATION OF ALTERNATIVES

It is important to consider each part of an individual alternative on its own merit. There may be a tendency to disregard an alternative because of concern about one portion of it. Separate consideration should be given to each of the areas within an alternative that are acceptable and those parts should be considered in the final design, even if the entire alternative is not implemented.

Cost is the primary basis of comparison for alternative designs. To ensure that costs are comparable within the alternatives proposed by the VE team, the designer's cost estimates, where possible, were used as the pricing basis. Where appropriate, the impact of energy costs, replacement costs, and effect on operations and maintenance are shown within each alternative.

Some of the alternatives are interrelated, so acceptance of one may preclude the acceptance of another. The reader should evaluate those alternatives carefully to select the ideas with the greatest beneficial impact to the project.



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **2**

DESCRIPTION: **ELIMINATE ALL SIDEWALKS**

SHEET NO.: **1 of 3**

**ORIGINAL DESIGN:**

The present design calls for 5-ft. sidewalks on both sides of the entire corridor, i.e., along Whittlesey Road from Bradley Park Drive to Veterans Parkway, for a distance of about 1.36 miles; and on Veterans Parkway from Gepca Drive/Frist Court north across Whittlesey Road, for about 0.52 miles. The total distance of the two projects is approximately 1.88 miles.

**ALTERNATIVE:**

Eliminate all sidewalks from the project.

**ADVANTAGES:**

- Reduces initial cost
- Reduces right-of-way costs
- Conforms to sustainable design parameters

**DISADVANTAGES:**

- Eliminates an amenity
- Users perceive a loss of safety

**DISCUSSION:**

The need to provide sidewalks throughout the entire length of the project does not seem warranted. The anticipated volume of traffic will not induce pedestrians to use the corridor as it creates an inhospitable/unwelcoming environment. In addition, the bulk of the type of commercial businesses are car dealerships, home improvement centers and discount super stores that are not conducive to pedestrian traffic.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 4,661,136	—	\$ 4,661,136
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 4,661,136	—	\$ 4,661,136

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **2**

DESCRIPTION: **ELIMINATE ALL SIDEWALKS**

SHEET NO.: **2 of 3**

Project STP-8060(2), P. I. No. 351010's cost estimate indicates the total amount of sidewalk to be **11,572 square yard** (sy) of 4" thick concrete. The cost is noted to be \$33.67/sy.

$$11,572 \text{ sy} \times 9 \text{ square feet (sf) / sy} = 104,175 \text{ sf} / 5 \text{ lf wide} = \mathbf{20,835 \text{ lf}}$$

Project STP-0005-00(749), P. I. No. 005749 does not have a cost breakdown but is presumed to have the same sidewalk intention. Since the length of this project is approximately 0.27 miles, the sidewalk area can be deduced as follows:

$$0.27 \text{ miles} \times 2 \text{ sides} \times 5,280 \text{ feet/mile} = 2,851.2 \text{ linear feet (lf) sidewalk. SAY } \mathbf{2,851 \text{ lf}}$$

$$2,851 \text{ lf} \times 5 \text{ lf of concrete} = 14,255 \text{ sf} / 9 \text{ sf/sy} = 1,582.8 \text{ sy. SAY } \mathbf{1,583 \text{ yd}}$$

$$\therefore \text{ the } \Sigma 20835 \text{ lf} + 2,851 \text{ lf} = \mathbf{23,686 \text{ lf}} \text{ of sidewalk} \times 5 \text{ lf wide} = \mathbf{118,430 \text{ sf}} / 9 \text{ sf/sy} = \mathbf{13,159 \text{ sy}}$$

See Alternative No. 3 for unit cost calculations for ROW cost at \$9.98/SF

# COST WORKSHEET



PROJECT: **STP-8060(2), P.I. No. 351010 & STP-0005-00(749), P.I. NO. 0005749** ALTERNATIVE NO: 2  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
*Muscogee County, GDOT*

SHEET NO.: 3 of 3

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/UNIT	TOTAL	NO. OF UNITS	COST/UNIT	TOTAL
Project STP-8060(2)							
Sidewalk	sy	11,572	33.67	389,629			
Project STP-0005-00(749)							
Sidewalk	sy	1,583	33.67	53,300			
Construction Subtotal				442,929			
Construction Markup at 25.86%				114,541			
Construction Total				557,470			
Right-of-Way Costs							
	sf	118,430	9.98	1,181,931			
ROW Subtotal				1,181,931			
ROW Markup at 247.20%				2,921,734			
ROW Total				4,103,666			
Sub-total				4,661,136			
Mark-up at				Included			
TOTAL				4,661,136			

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 3

DESCRIPTION: **RETAIN SIDEWALKS IN SELECT AREAS ONLY**

SHEET NO.: 1 of 4

## ORIGINAL DESIGN:

The present design calls for 5-ft. sidewalks on both sides of the entire corridor, i.e., along Whittlesey Road from Bradley Park Drive to Veterans Parkway, for a distance of about 1.36 miles; and on Veterans Parkway from Gepca Drive/Frist Court north across Whittlesey Road, for about 0.52 miles. The total distance of the two projects is approximately 1.88 miles.

## ALTERNATIVE:

Provide sidewalks in those areas with the highest likelihood of pedestrian traffic, i.e., on Whittlesey Road between Whitesville Road and Bradley Park Drive and on the southeastern side of Veterans Parkway between Frist Court and Whittlesey Road.

## ADVANTAGES:

- Reduces initial costs
- Reduces right-of-way costs
- Provides sidewalks where use is most likely needed
- Conforms to sustainable design parameters

## DISADVANTAGES:

- Eliminates an amenity
- Need to confirm that selected areas are the correct places to retain sidewalks
- Users perceive a loss of safety

## DISCUSSION:

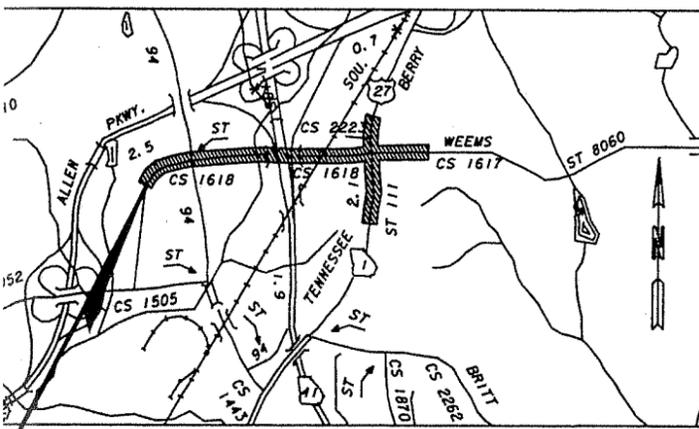
The need to provide sidewalks throughout the entire length of the project does not seem warranted. In and around residential areas (between Whitesville Road and Bradley Park Drive on Whittlesey Road) or near the Hughston Orthopedic Hospital (between Frist Court and Whittlesey Road on the eastside of Veterans Parkway) would probably be the most likely places where pedestrian traffic will occur.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,481,770	—	\$ 3,481,770
ALTERNATIVE	\$ 160,143	—	\$ 160,143
SAVINGS	\$ 3,321,627	—	\$ 3,321,627

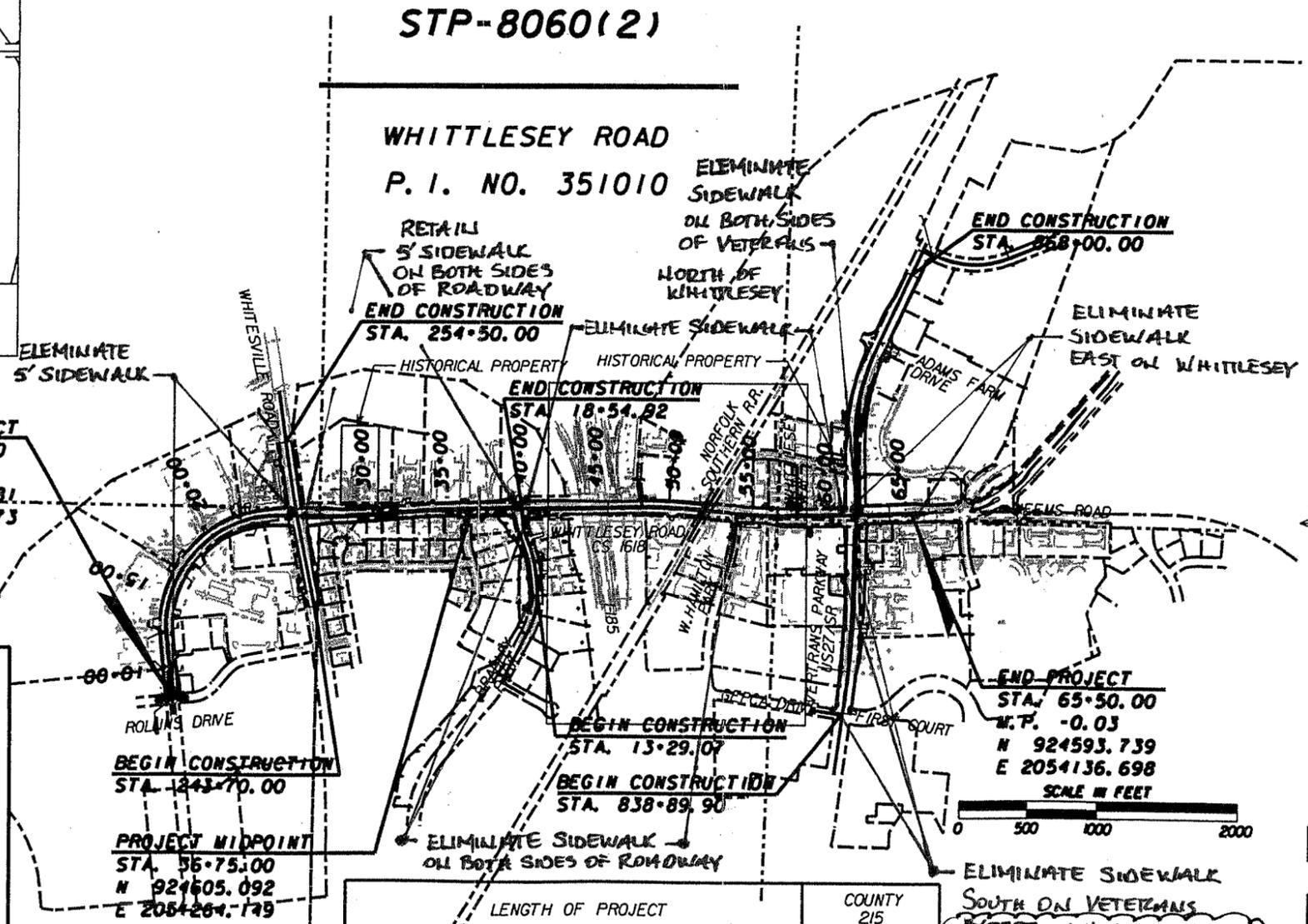
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	STP-8060(2)	0001	04

# DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

## PLAN AND PROFILE OF PROPOSED WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD MUSCOGEE COUNTY STP-8060(2)



LOCATION SKETCH



PROJECT STP-8060(2)

**BEGIN PROJECT**  
STA. 8+00.00  
M.P. 1.06  
N 923561.081  
E 2049319.873

THIS PROJECT IS LOCATED 100 PERCENT WITHIN CONGRESSIONAL DISTRICT NO. 8

THIS PROJECT IS LOCATED 100 PERCENT WITHIN MUSCOGEE COUNTY.

**SIGN DATA:**

TRAFFIC A. D. T. :	23500 (2008)
TRAFFIC A. D. T. :	33500 (2028)
TRAFFIC D. H. V. :	3450 (2028)
SECTIONAL DIST. :	55 %
TRUCKS :	2 %
HR. TRUCKS % :	5 %
SPEED DESIGN :	45 MPH
HORIZONTAL DATUM :	NAD 83/94
VERTICAL DATUM :	NAVD88
<b>UTM ZONE COORDINATES</b>	
PROJECT DESIGNATION:	EXEMPT
PROJECT CLASS:	URBAN MAJOR COLLECTOR
EXISTING CLASS:	MAJOR PROJ/EXIST LOC

**BEGIN CONSTRUCTION**  
STA. 1243+70.00

**BEGIN CONSTRUCTION**  
STA. 838+89.90

**PROJECT MIDPOINT**  
STA. 56+75.00  
N 924605.092  
E 2054264.149

LENGTH OF PROJECT	MUSCOGEE COUNTY	COUNTY	215
NET LENGTH OF ROADWAY		MILES	1.089
NET LENGTH OF BRIDGES			0.000
NET LENGTH OF PROJECT			1.089

ELIMINATE SIDEWALK SOUTH ON VETERANS EXCEPT ON HOSPITAL SIDE FROM FRIST CT. TO WHITTLESEY RD.

SUBMITTED TO GDOT BY:

ALFRED O. ENLOE  
GA P.E. NO. 8284



KISINGER CAMPO AND ASSOCIATES CORP.  
1720 Peachtree Street N.W., Suite 1048  
Atlanta, Georgia 30309  
(404) 607-1676  
Fax: (404) 607-1824

PLANS PREPARED UNDER THE SUPERVISION OF

OFFICE OF URBAN DESIGN

LOCATION AND DESIGN APPROVAL MAY 4, 2006

DATE	CHIEF ENGINEER
PLANS COMPLETED	- -
REVISIONS	

ALL DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS OR IN ANYWAY INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON FIELD SURVEYING DATA.

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
**Muscogee County, Georgia Department of Transportation, District 3**  
**Design Development Stage**

ALTERNATIVE NO.:

**3**

SHEET NO.: **3** of **4**

## SIDEWALK LOCATIONS TO REMAIN

BEG. STA. 26+00 LT TO RT. H }  
 END STA. 39+50 LT TO RT. H } 2,594 LF

BEG. 839+20 RT. }  
 END. 844+10.00 RT. } 490 LF

BEG STA. 54+40 RT. }  
 END STA. 61+00 RT. } 640.00 LF

## ON VETERANS PARKWAY:

BEG. STA 838+89.90 }  
 END STA 851+58.90 } 1,269 LF

BEG. STA. 844+60 LT. }  
 END STA. 851+00 LT. } 567.00 LF

BEG STA. 844+60 RT. }  
 END STA. 851+00 RT. } 624 LF

TOTAL LENGTH OF SIDEWALK RETAINED = 6,184 LF + 10% = 6,802 LF

6,802 LF x 5' ÷ 9 = 3,779 SY

TOTAL SIDEWALK LENGTH = 20,830 LF + 2,851 LF (FROM STP 0005-00(749)) = 23,681 LF

∴ REDUCTION: 23,681 LF - 6,802 = 16,879 LF

16,879 LF x 5' = 84,394 SF / 43,360 SF/AC = 1.97 AC.

FOR CONTRACT STP 0005-00(749) SEE ACT. # 6 FOR SIDEWALK CALCULATIONS.

## GUESSING ROW ON A PER SF COST:

551,452 SF OF COMMERCIAL & RESIDENTIAL & CORRESPONDING ELEMENTS,  
 +25% TO ACCOUNT FOR STP-0005-00(749): 551,452 + 25% = 689,315 SF  
 OF ROW.

ROW COSTS = \$6,882,266 ∴ \$6,882,266 / 689,315 SF = \$9.98 / SF



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 4

DESCRIPTION: **CLOSEOFF WEST HAMILTON PARK DRIVE**

SHEET NO.: 1 of 7

**ORIGINAL DESIGN:** (Sketch attached)

The current design calls for left-turn lanes in both the eastbound (EB) and westbound (WB) directions onto West Hamilton Park Drive from the mainline. The EB turning lane actually commences west of the railroad crossing and queues vehicles on the crossing itself.

**ALTERNATIVE:** (Sketch attached)

Eliminate both EB and WB left-turning lanes from the mainline onto West Hamilton Park Drive.

**ADVANTAGES:**

- Increases left-lane storage on Veterans Parkway
- Improves safety
- Reduces construction and right-of-way costs
- Reduces impacts to Parcel Nos. 32 and 34
- Removes left-hand storage off the railroad tracks

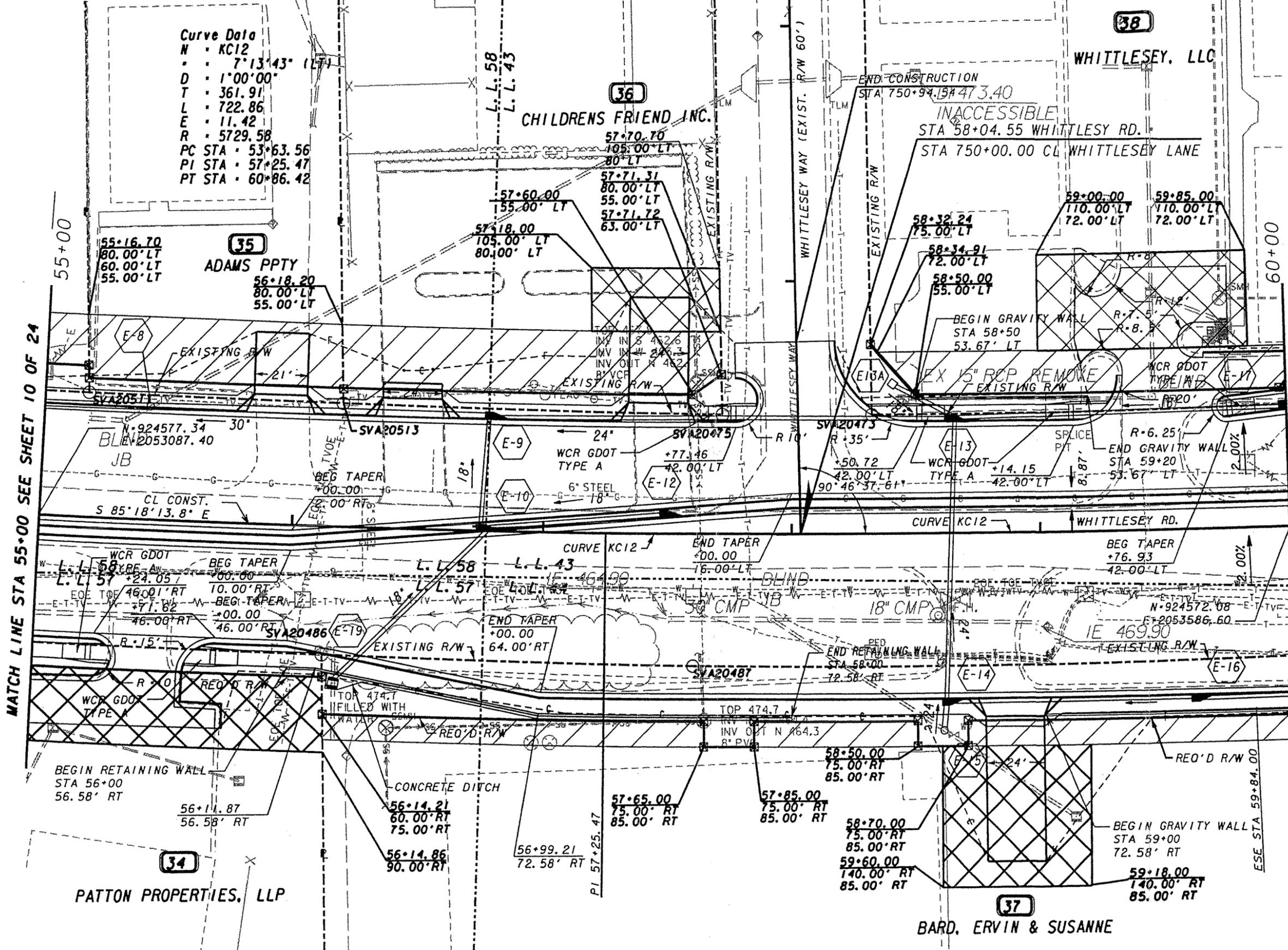
**DISADVANTAGES:**

- Limits access to businesses
- Lengthens alternate route

**DISCUSSION:**

West Hamilton Park Drive is a commercial business access. Closing the road would eliminate truck traffic on Whittlesey Road and conflict with the operation of the intersection of Whittlesey Road and Veterans Parkway. This would also remove the left-lane storage from the railroad tracks, greatly improving safety. This commercial area continues to have access to Veterans Parkway further south via Gepca Drive which is a signalized intersection, again improving safety.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 521,274	—	\$ 521,274
ALTERNATIVE	\$ 211,232	—	\$ 211,232
SAVINGS	\$ 310,042	—	\$ 310,042

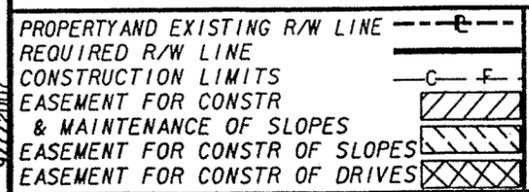


**Curve Data**  
 N : KC12  
 Δ : 7°13'43" (LT)  
 D : 1'00'00"  
 T : 361.91'  
 L : 722.86'  
 E : 11.42'  
 R : 5729.58'  
 PC STA : 53+63.56  
 PI STA : 57+25.47  
 PT STA : 60+86.42

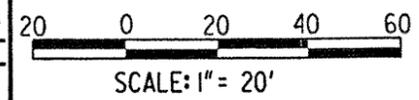
MATCH LINE STA 55+00 SEE SHEET 10 OF 24

MATCH LINE STA 60+00 SEE SHEET 12 OF 24

**AS DESIGNED**



BEGIN LIMIT OF ACCESS.....BLA  
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 LIMIT OF ACCESS  
 REQUIRED R/W AND LIMIT OF ACCESS

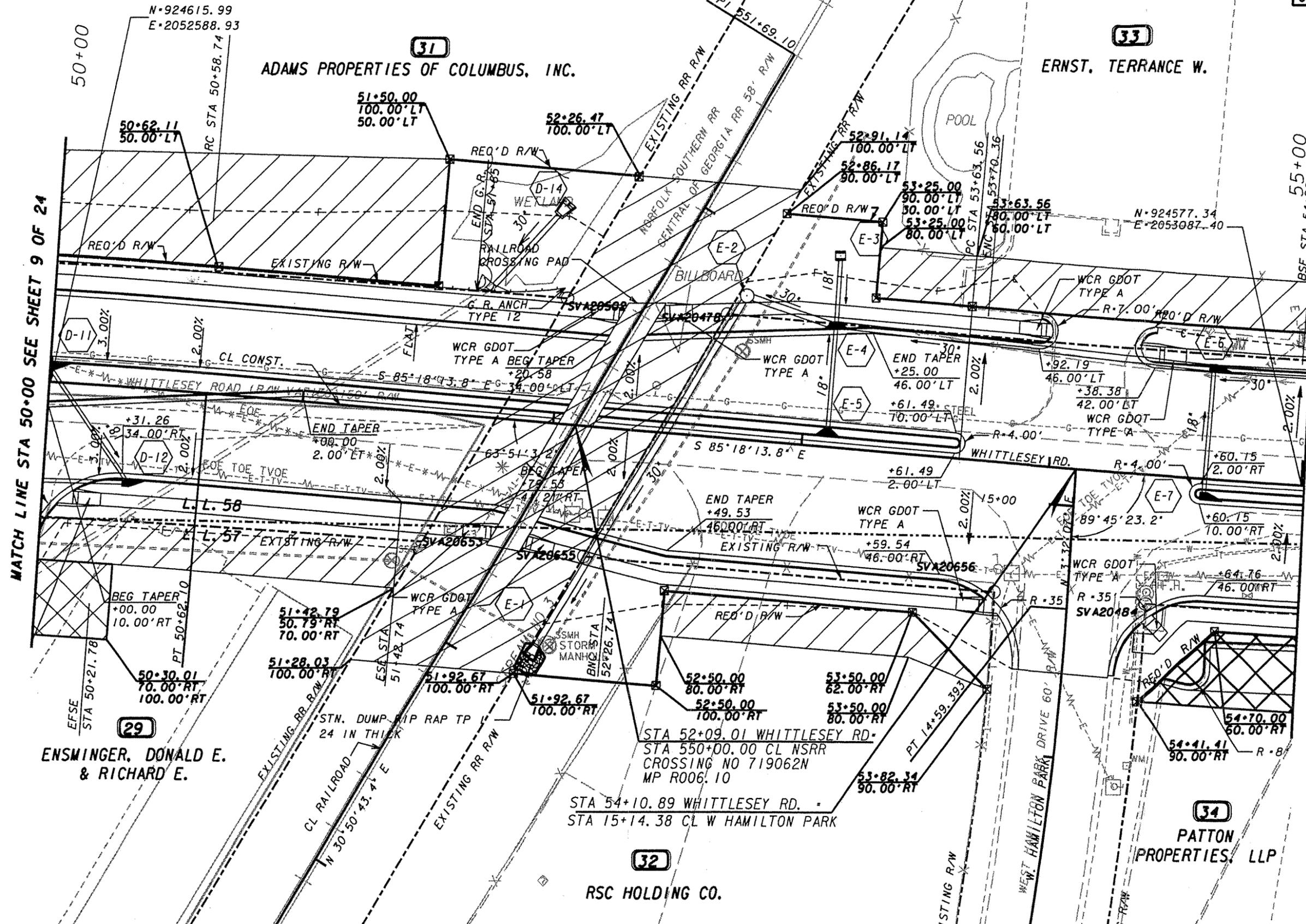


DATE	REVISIONS	DATE	REVISIONS

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 11 OF 24

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ALT 4  
3 OF 7



MATCH LINE STA 50+00 SEE SHEET 9 OF 24

MATCH LINE STA 55+00 SEE SHEET 10 OF 24

ENSWINGER, DONALD E. & RICHARD E.

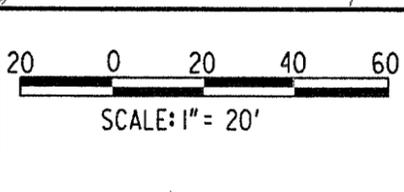
PATTON PROPERTIES, LLP

RSC HOLDING CO.

AS DESIGNED

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....	BLA
END LIMIT OF ACCESS.....	ELA
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



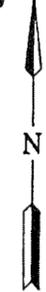
DATE	REVISIONS	DATE	REVISIONS

**KISINGER CAMPO & ASSOCIATES CORP.**  
1720 PEACHTREE ST., N.W., SUITE 1048  
ATLANTA, GA 30309

GEORGIA DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE  
DATE 4-14-06 SH 10 OF 24

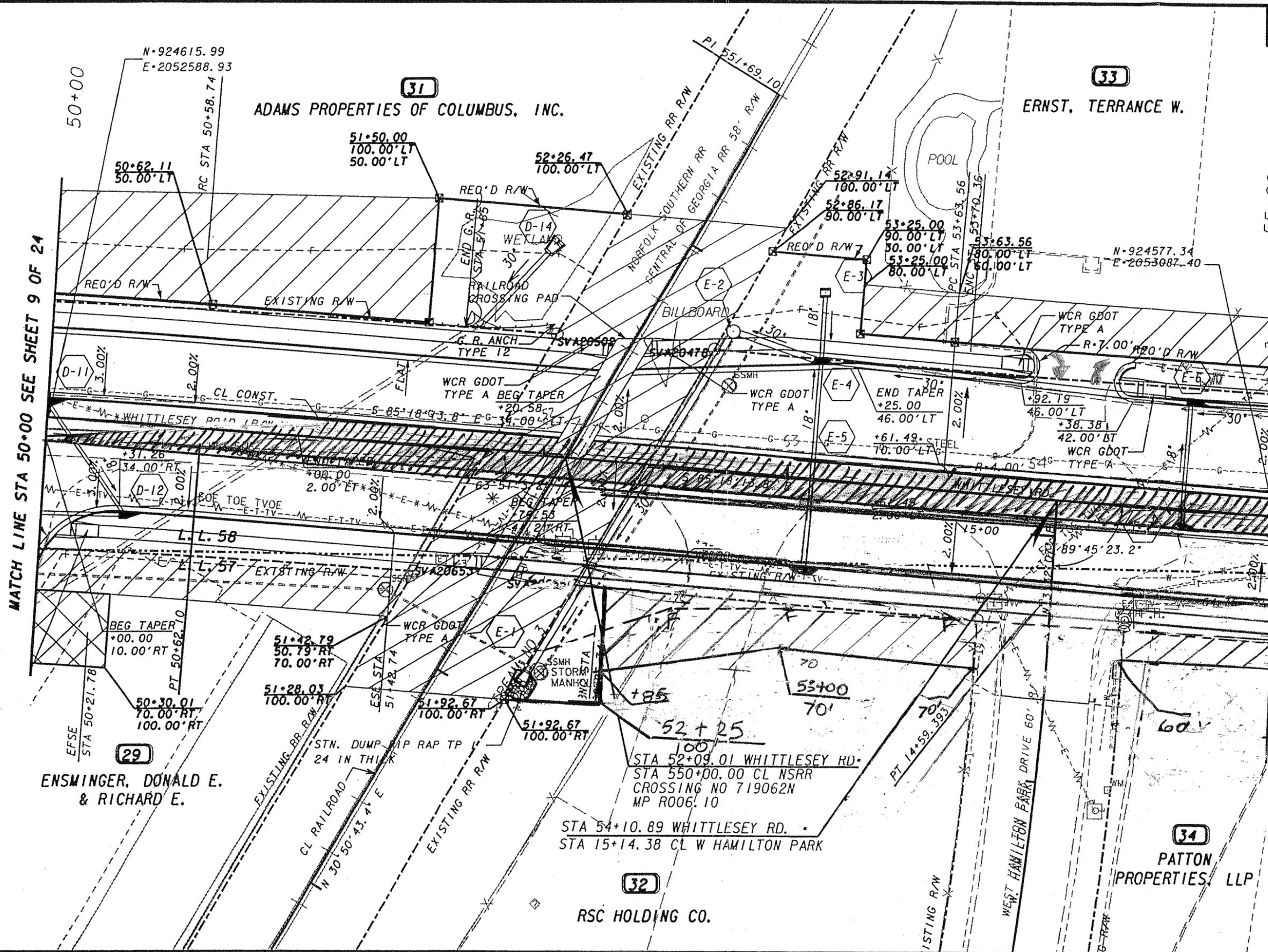
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ALT. No 4  
4 OF 7

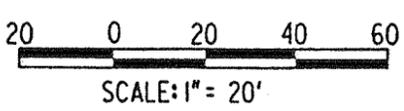


MATCH LINE STA 50+00 SEE SHEET 9 OF 24

MATCH LINE STA 55+00 SEE SHEET 10 OF 24



PROPERTY AND EXISTING R/W LINE	---E---	BEGIN LIMIT OF ACCESS.....	BLA
REQUIRED R/W LINE	---C---	END LIMIT OF ACCESS.....	ELA
CONSTRUCTION LIMITS	---F---	LIMIT OF ACCESS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES		REQUIRED R/W AND LIMIT OF ACCESS	---
EASEMENT FOR CONSTR OF SLOPES			
EASEMENT FOR CONSTR OF DRIVES			



DATE	REVISIONS	DATE	REVISIONS

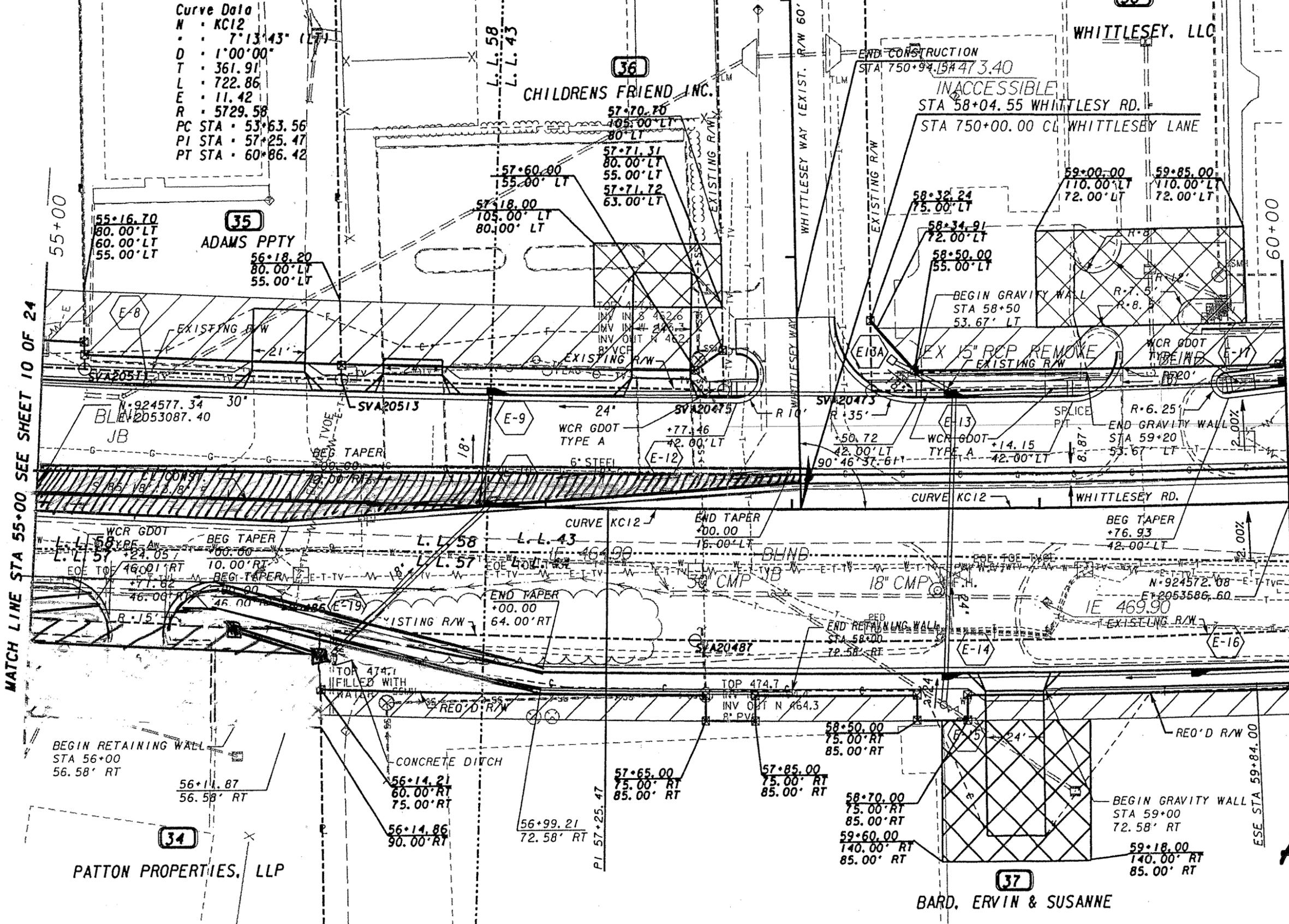


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**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE

ALT. No. 4  
5 of 7



Curve Data  
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 D : 1'00'00"  
 T : 361.91  
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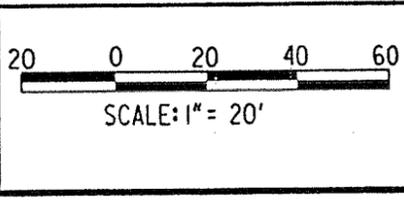
MATCH LINE STA 55+00 SEE SHEET 10 OF 24

MATCH LINE STA 60+00 SEE SHEET 12 OF 24

**ALTERNATIVE**

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR	---
& MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....	BLA
END LIMIT OF ACCESS.....	ELA
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS

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 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

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**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 11 OF 24

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# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),**  
**P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF**  
**WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 4

DESCRIPTION: **CLOSEOFF WEST HAMILTON PARK DRIVE**

SHEET NO.: 6 of 7

Delete Original Paving – Right-turn lane at Hamilton Park Drive and both left-turn lanes at median opening

Right Lane:  $[12' \times (250' + 70' + 40')] = 4,320 \text{ sf}/9 \text{ sf/sy} = 480 \text{ sy}$

Left Lanes:  $12' \times (315' + 235') = 6,600 \text{ sf}/9 \text{ sf/sy} = 733 \text{ sy}$

Median:  $20' \times 90' = 1,800 \text{ sf}/9 \text{ sf/sy} = 200 \text{ sy}$

**TOTAL PAVING =  $\Sigma 480 \text{ sy} + 733 \text{ sy} + 200 \text{ sy} = 1,413 \text{ sy}$**

12.5 mm Asphalt paving at 165 pounds (lb)/sy =  $(165 \text{ lb/sy} \times 1,413 \text{ sy})/2,000 \text{ lb/tn} = 117 \text{ tn}$

19 mm Asphalt paving at 220 lb/sy =  $(220 \text{ lb/sy} \times 1,413 \text{ sy})/2,000 \text{ lb/tn} = 156 \text{ tn}$

25 mm Asphalt paving at 660 lb/sy =  $(660 \text{ lb/sy} \times 1,413 \text{ sy})/2,000 \text{ lb/tn} = 467 \text{ tn}$

12" G.A.B at 1,320 lb/sy =  $(1,320 \text{ lb/sy} \times 1,413 \text{ sy})/2,000 \text{ lb/tn} = 933 \text{ tn}$

Additional concrete median:  $12' \times (320' + 220') = 4,104 \text{ sf}/9 \text{ sf/sy} = 456 \text{ sy}$

Additional concrete sidewalk:  $40' \times 5' = 200 \text{ sf}/9 \text{ sf/sy} = 22 \text{ sy}$

Original Right-of-Way:  $((60' + 40')/2) \times 38' + (12' \times 165') = 3,880 \text{ sf}$

$(28'/2) \times 34' \times 2 = 952 \text{ sf}$

$(60' + 114') \times 10' = 1,740 \text{ sf}$

**TOTAL ORIGINAL RIGHT-OF-WAY =  $\Sigma 3,880 \text{ sf} + 952 \text{ sf} + 1,740 \text{ sf} = 6,572 \text{ sf}$**

**TOTAL ORIGINAL EASEMENT =  $(100' \times 18') + (20' \times 18') = 2,160 \text{ sf}$**

**TOTAL PROPOSED RIGHT-OF-WAY:  $(45' \times 20') + (35' \times 5') = 1,075 \text{ sf}$**

Proposed Easement:  $(25' + 20')/2 \times 75' = 1,688 \text{ sf}$

$(20' \times 40') + (10' \times 160') = 2,400 \text{ sf}$

**TOTAL PROPOSED EASEMENT =  $\Sigma 1,688 \text{ sf} + 2,400 \text{ sf} = 4,088 \text{ sf}$**

# COST WORKSHEET



PROJECT: **STP-8060(2), P.I. No. 351010 & STP-0005-00(749), P.I. NO. 0005749** ALTERNATIVE NO: 4  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
*Muscogee County, GDOT*

SHEET NO.: 7 of 7

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/UNIT	TOTAL	NO. OF UNITS	COST/UNIT	TOTAL
Concrete Curb and Gutter	lf		15.02		200	15.02	3,004
Asphalt Conc. - 12.5 mm	tn	117	75.00	8,775			
Asphalt Conc. - 19 mm	tn	156	75.00	11,700			
Asphalt Conc. - 25 mm	tn	467	75.00	35,025			
GAB -12"	tn	933	19.98	18,641			
Concrete Median	sy				456	54.31	24,765
Concrete Sidewalk	sy				22	33.67	741
Conc. C & G Tp 2	lf	120	19.04	2,285			
18" Storm Drain Pipe	lf				36	45.96	1,655
Construction Subtotal				76,426			30,165
Construction Markup at 25.86%				19,764			7,801
Construction Total				96,190			37,965
Commercial R/W	sf	6,572	16.00	105,152	1,075	16.00	17,200
Commercial Easm't	sf	2,160	8.00	17,280	4,088	8.00	32,704
ROW Subtotal				122,432			49,904
ROW Markup at 247.20%				302,652			123,363
ROW Total				425,084			173,267
Sub-total				521,274			211,232
Mark-up at				Included			Included
TOTAL				521,274			211,232

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **5**

DESCRIPTION: **ALLOW RIGHT-IN/RIGHT-OUT ONLY AT  
WEST HAMILTON PARK DRIVE**

SHEET NO.: **1 of 5**

**ORIGINAL DESIGN:**

The current design calls for left-turn lanes in both the EB and WB directions onto West Hamilton Park Drive from the mainline. The EB turning lane actually commences west of the railroad crossing and queues vehicles on the crossing itself.

**ALTERNATIVE:** (Sketch attached)

Eliminate both EB and WB left-turning lanes from the mainline onto West Hamilton Park Drive. Permit EB right-in/right-out onto West Hamilton Park Drive from Whittlesey Road.

**ADVANTAGES:**

- Improves safety
- Reduces construction and right-of-way costs
- Reduces impacts to Parcel No. 27
- Minimizes through traffic on Bradley Park Drive
- Helps redirect through traffic to use either Whittlesey Road or Whitesville Parkway

**DISADVANTAGES:**

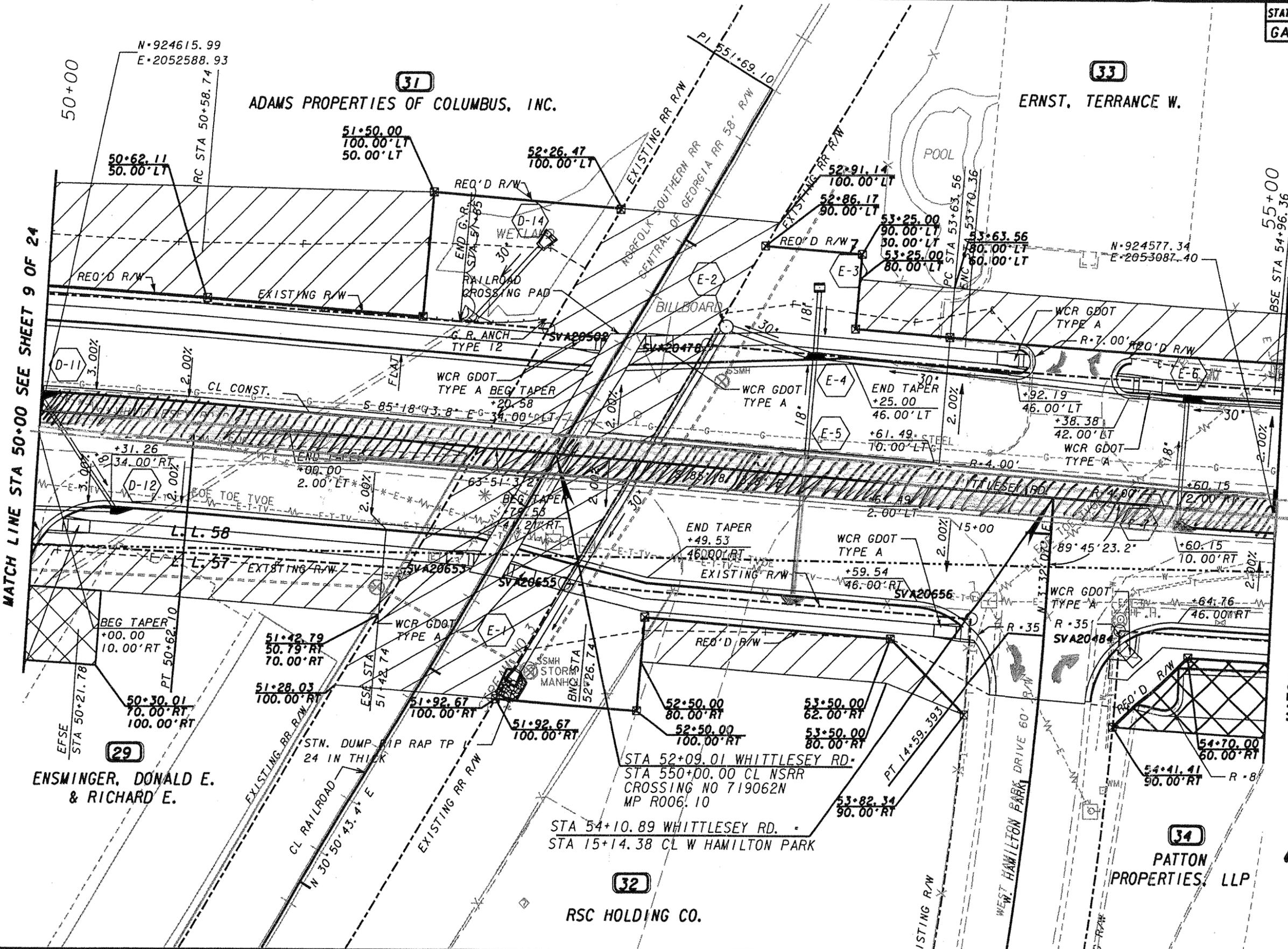
- Limits access to businesses

**DISCUSSION:**

West Hamilton Park Drive is a commercial business access. Allowing right-in/right-out only would eliminate truck traffic on Whittlesey Road and conflict with the operation of the intersection of Whittlesey Road and Veterans Parkway. This would also remove the left-lane storage from the railroad tracks, greatly improving safety. This commercial area continues to have access to Veterans Parkway further south via Gepca Drive which is a signalized intersection, again improving safety.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 61,555	—	\$ 61,555
ALTERNATIVE	\$ 37,727	—	\$ 37,727
SAVINGS	\$ 23,828	—	\$ 23,828

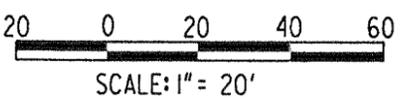
ALT No 5  
SHEET 2 OF 5



MATCH LINE STA 50+00 SEE SHEET 9 OF 24

MATCH LINE STA 55+00 SEE SHEET 10 OF 24

PROPERTY AND EXISTING R/W LINE	---e---	BEGIN LIMIT OF ACCESS.....BLA
REQUIRED R/W LINE	---f---	END LIMIT OF ACCESS.....ELA
CONSTRUCTION LIMITS	---c---	LIMIT OF ACCESS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	[Hatched Box]	REQUIRED R/W AND LIMIT OF ACCESS
EASEMENT FOR CONSTR OF SLOPES	[Cross-hatched Box]	
EASEMENT FOR CONSTR OF DRIVES	[Diagonal-hatched Box]	

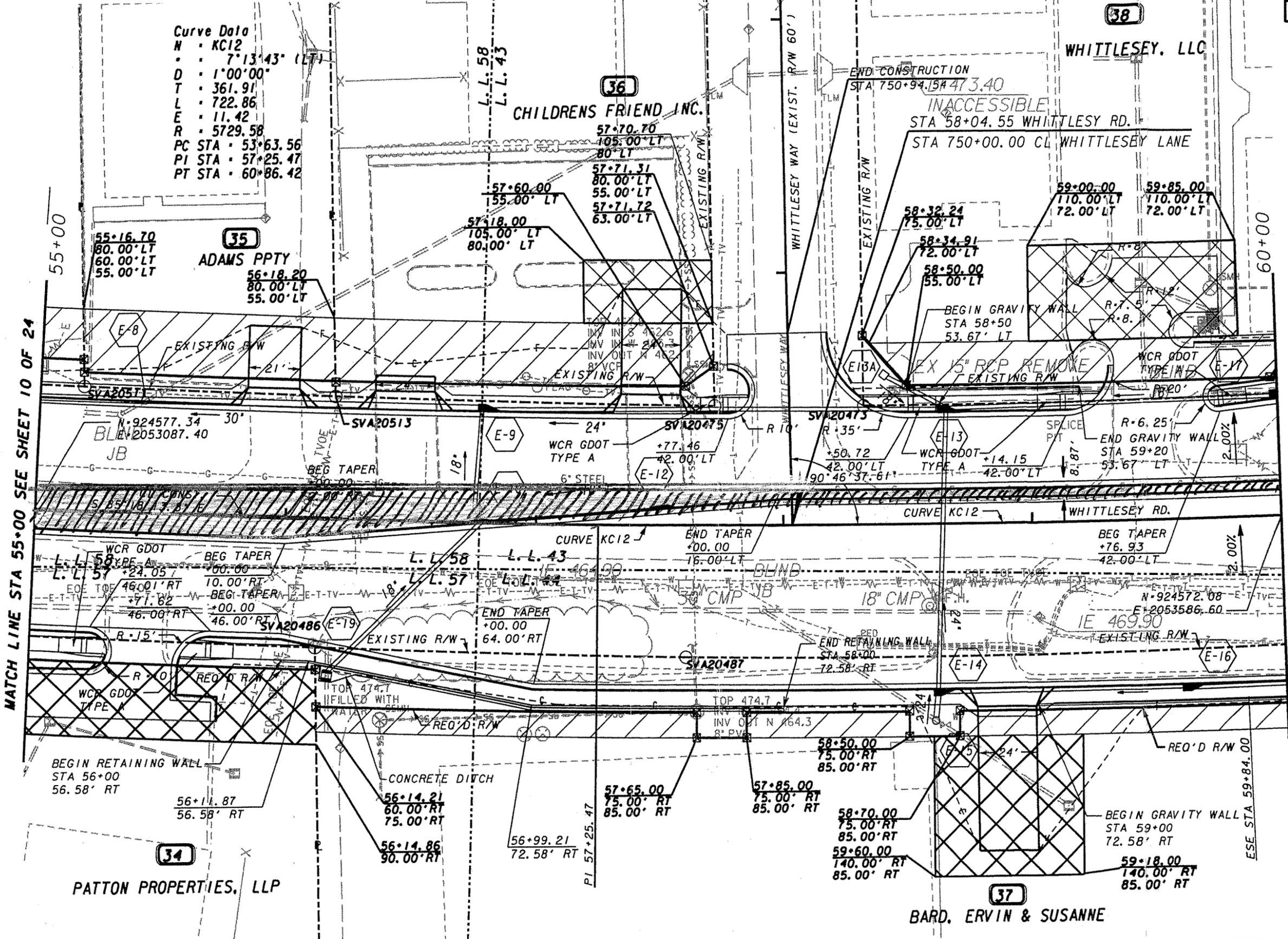


DATE	REVISIONS	DATE	REVISIONS

**KISINGER CAMPO & ASSOCIATES CORP.**  
1720 PEACHTREE ST., N.W., SUITE 1048  
ATLANTA, GA 30309

GEORGIA  
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**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE

ALT. No 5  
SHEET 3 OF 5



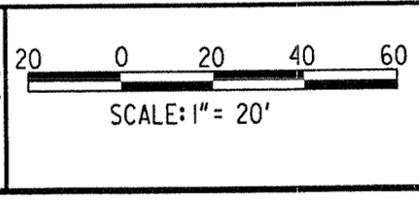
MATCH LINE STA 55+00 SEE SHEET 10 OF 24

MATCH LINE STA 60+00 SEE SHEET 12 OF 24

**ALTERNATIVE**

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....BLA	---
END LIMIT OF ACCESS.....ELA	---
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS

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**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE  
DATE 4-14-06 SH 11 OF 24

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PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **5**

DESCRIPTION: **ALLOW RIGHT-IN/RIGHT-OUT ONLY AT  
WEST HAMILTON PARK DRIVE**

SHEET NO.: **4 of 5**

Delete Original Paving – both left-turn lanes at median opening

Left Lanes

$$12' \times (315' + 235') = 6,600 \text{ sf} / 9 \text{ sf/sy} = 733 \text{ sy}$$

Median

$$20' \times 90' = 1,800 \text{ sf} / 9 \text{ sf/sy} = 200 \text{ sy}$$

**TOTAL PAVING = 933 sy**

$$12.5 \text{ mm Asphalt paving at } 165 \text{ lb/sy} = 165 \times 933 / 2,000 \text{ lb/tn} = 77 \text{ tn}$$

$$19 \text{ mm Asphalt paving at } 220 \text{ lb/sy} = 220 \times 933 / 2,000 \text{ lb/tn} = 103 \text{ tn}$$

$$25 \text{ mm Asphalt paving at } 660 \text{ lb/sy} = 660 \times 933 \text{ sy} / 2,000 \text{ lb/tn} = 308 \text{ tn}$$

$$12'' \text{ G.A.B at } 1,320 \text{ lb/sy} = 1,320 \text{ lb/sy} \times 933 \text{ sy} / 2,000 \text{ lb/tn} = 616 \text{ tn}$$

Additional concrete median

$$12' \times (320' + 220') = 4,104 \text{ sf} / 9 \text{ sf/sy} = 456 \text{ sy}$$



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **6**

DESCRIPTION: **DELAY SIDEWALK PAVING**

SHEET NO.: **1 of 3**

## ORIGINAL DESIGN:

The present design calls for 5-ft. sidewalks on both sides of the entire corridor, i.e., along Whittlesey Road from Bradley Park Drive to Veterans Parkway, for a distance of about 1.36 miles; and on Veterans Parkway from Gepca Drive/Frist Court north across Whittlesey Road, for about 0.52 miles. The total distance of the two projects is approximately 1.88 miles.

## ALTERNATIVE:

Prepare the shoulders to accept future sidewalk paving. In the meantime, provide permanent grassing on the shoulder area corresponding to the sidewalk pavement.

## ADVANTAGES:

- Reduces initial cost
- Allows users to establish sidewalk limits
- Conforms to sustainable design parameters
- Maintains safety distances

## DISADVANTAGES:

- Delays the cost of concrete paving
- Requires a period of time where users will walk on grassed shoulder
- Users perceive a loss of safety

## DISCUSSION:

The need to provide sidewalks throughout the entire length of the project does not seem warranted. In and around residential areas or near the Hughston Orthopedic Hospital would probably see some pedestrian movement. However, just like in academic campus planning, final paths and walkways are not paved, allowing the student and faculty to establish the walking paths that warrant paving. The same approach can be made in this circumstance, and after a reasonable period of time, the users will establish the paths to be paved.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 557,470	—	\$ 557,470
ALTERNATIVE	\$ 3,504	—	\$ 3,504
SAVINGS	\$ 553,966	—	\$ 553,966

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **6**

DESCRIPTION: **DELAY SIDEWALK PAVING**

SHEET NO.: **2 of 3**

Project STP-8060(2), P. I. No. 351010's cost estimate indicates the total amount of sidewalk to be **11,572 sy** of 4" thick concrete. The cost is noted to be \$33.67/sy.

Project STP-0005-00(749), P. I. No. 005749 does not have a cost breakdown but is presumed to have the same sidewalk intention. Since the length of this project is approximately 0.27 miles, the sidewalk area can be deduced as follows:

$0.27 \text{ miles} \times 2 \text{ sides} \times 5,280 \text{ feet/mile} = 2,851.2 \text{ linear feet sidewalk. SAY } 2,851 \text{ lf.}$   
 $2,851 \text{ lf} \times 5 \text{ lf of concrete} = 14,255 \text{ sf. } 14,255 \text{ sf}/9 \text{ sf/sy} = 1,582.8 \text{ sy. SAY } 1,583 \text{ yd.}$

Project STP-8060(2), P. I. No. 351010's cost estimate indicates the total amount of permanent grassing to be **22 acres (ac)**. The cost is noted to be \$1023.43/ac. Need to determine acres of permanent grassing needed in lieu of concrete pavement:

$1 \text{ acre} = 4,840/\text{sy.}$   
 $11,572 \text{ sy of concrete sidewalk}/4,840 \text{ ac/sy} = \mathbf{2.39 \text{ ac.}}$

As noted above, project STP-0005-00(749), P. I. No. 005749 does not have a cost breakdown but is presumed to have the same sidewalk intention. The permanent grassing is determined the same way:

$1 \text{ acre} = 4,840/\text{sy.}$   
 $1,583 \text{ sy of concrete sidewalk}/4,840 \text{ ac/sy} = \mathbf{0.33 \text{ ac.}}$



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 7

DESCRIPTION: **CLOSE OFF BRADLEY PARK AT WHITTLESEY ROAD**

SHEET NO.: 1 of 9

**ORIGINAL DESIGN:** (Sketch attached)

The current design calls for left-turn lanes in both the EB and WB directions onto Bradley Park Drive from the mainline. These turning movements service the commercial/business areas on the east side of Bradley Park Drive.

**ALTERNATIVE:** (Sketch attached)

Eliminate both EB and WB left-turning lanes from the mainline onto Bradley Park Drive.

**ADVANTAGES:**

- Improves safety
- Reduces construction and right-of-way costs
- Reduces impacts to Parcel No. 27
- Eliminates through traffic on Bradley Park Drive
- Redirects through traffic to use either Whittlesey Road or Whitesville Parkway

**DISADVANTAGES:**

- Limits access to businesses

**DISCUSSION:**

Bradley Park is primarily a commercial/business access. Closing the road would eliminate through traffic from using Bradley Park Drive. Traffic could use the new Whittlesey Road or Whitesville Parkway as alternate routes.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,381,060	—	\$ 1,381,060
ALTERNATIVE	\$ 80,386	—	\$ 80,386
SAVINGS	\$ 1,300,674	—	\$ 1,300,674

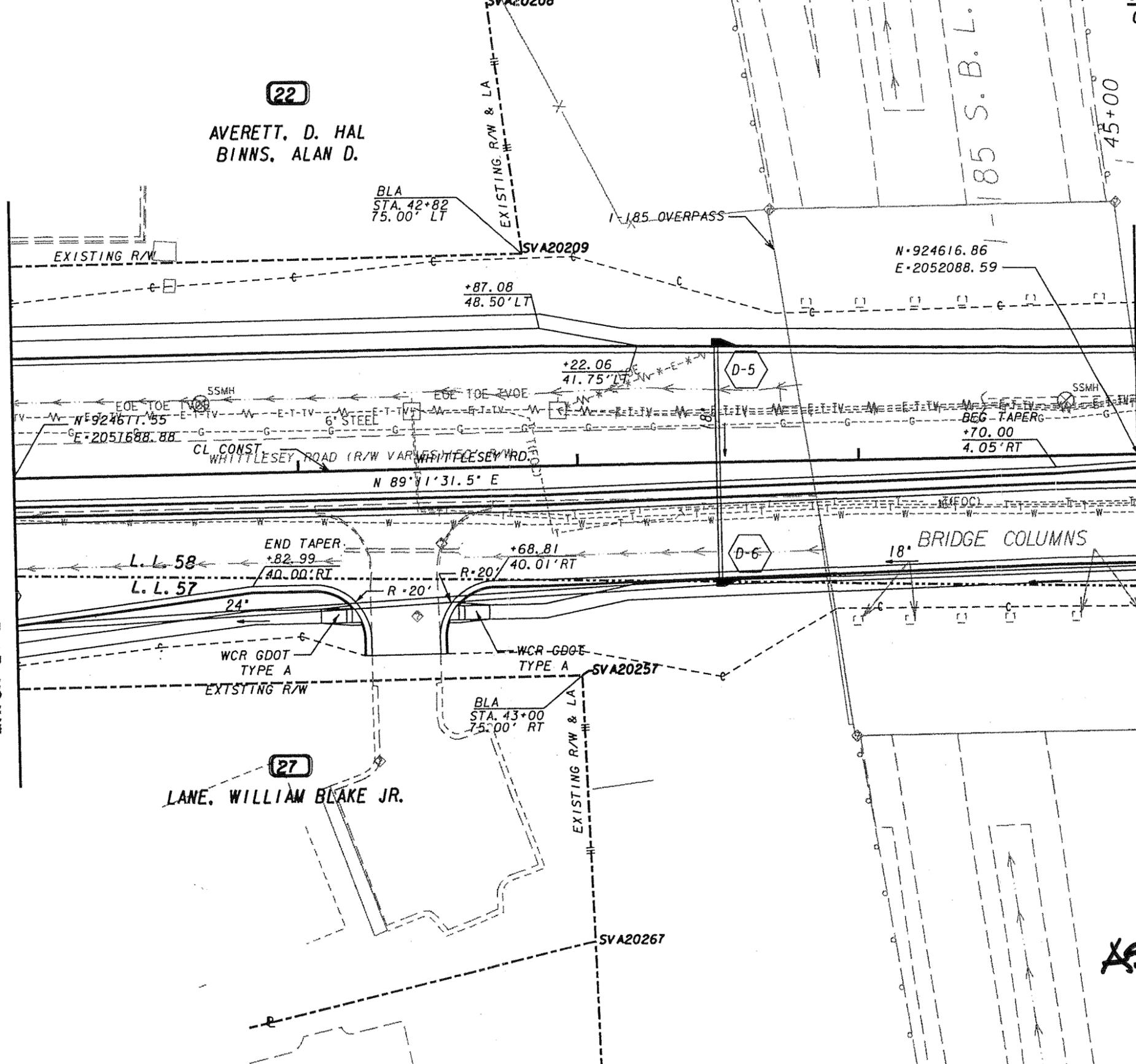


ALT. 7  
**SHEET 8 OF 9**



MATCH LINE STA 41+00 SEE SHEET 7 OF 24

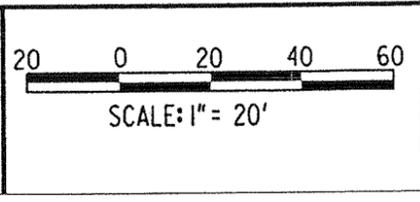
MATCH LINE STA 45+00 SEE SHEET 9 OF 24



**AS DESIGNED**

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REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	▨
EASEMENT FOR CONSTR OF SLOPES	▩
EASEMENT FOR CONSTR OF DRIVES	▧

BEGIN LIMIT OF ACCESS.....BLA	---
END LIMIT OF ACCESS.....ELA	---
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS

**KISINGER CAMPO & ASSOCIATES CORP.**  
 1720 PEACHTREE ST., N.W., SUITE 1046  
 ATLANTA, GA 30309

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 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 8 OF 24

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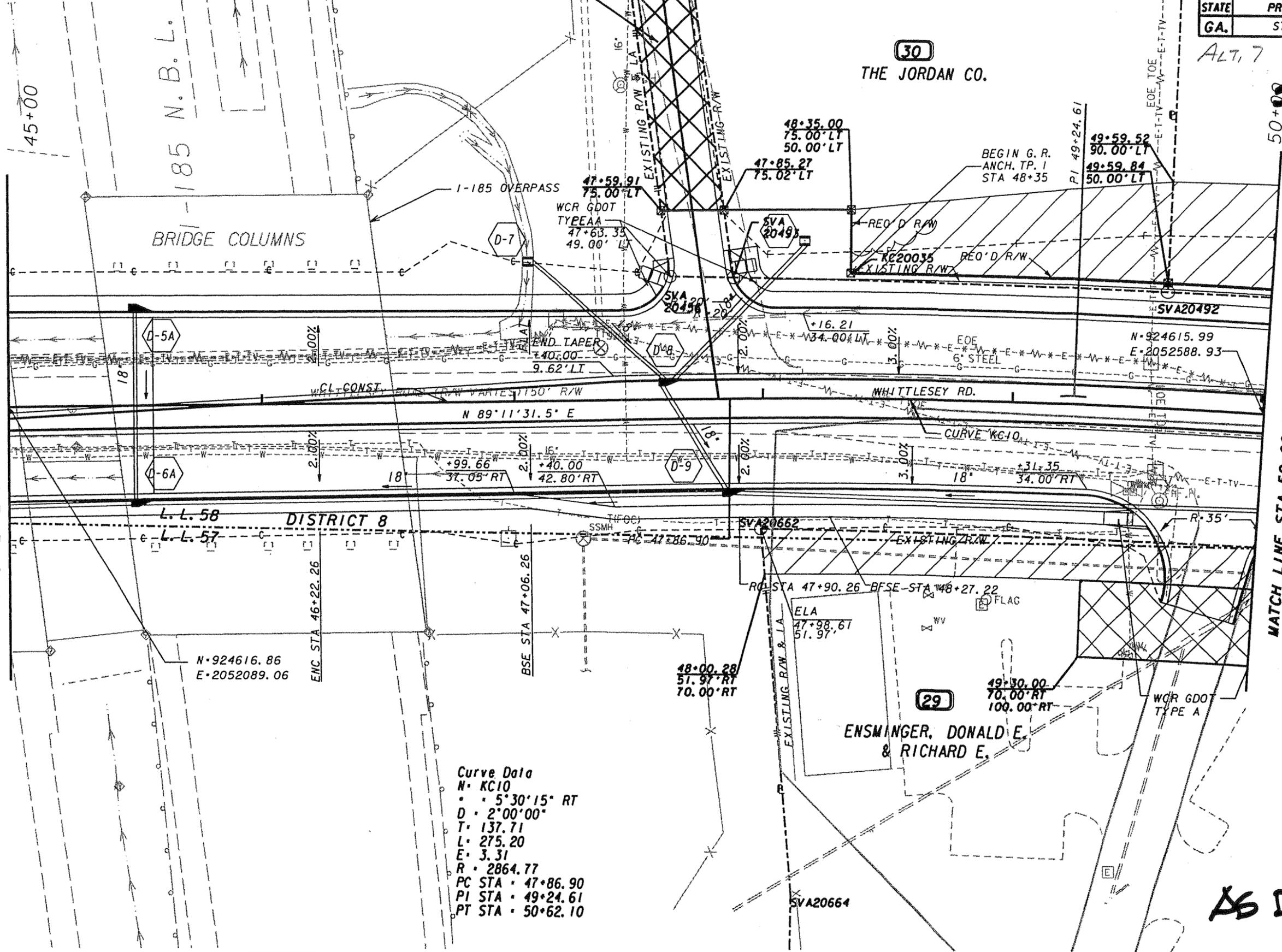
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SHEET 4 OF 9

MATCH LINE STA 45+00 SEE SHEET 8 OF 24

MATCH LINE STA 50+00 SEE SHEET 10 OF 24

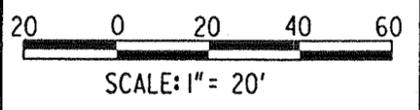


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 PT STA: 50+62.10

AS DESIGNED

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....BLA	---
END LIMIT OF ACCESS.....ELA	---
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS



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 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 9 OF 24

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**22 SHEET 5 OF 9**

AVERETT, D. HAL  
 BINNS, ALAN D.

STA. 39+98.17 WHITTLESEY RD-  
 STA. 19+10.06 CL BRADLEY PARK

STN. DUMP RIP RAP TP 1  
 24 IN THICK

WETLAND

MATCH LINE STA 35+00 SEE SHEET 6 OF 24

MATCH LINE STA 41+00 SEE SHEET 8 OF 24

18

NORTHSIDE CHAPEL  
 CHURCH OF GOD  
 OF PROPHECY

BEGIN G. R.  
 ANCH. TP. 1  
 STA 37+25

-126' DOUBLE 7' x 6'  
 BOX CULVERT

39+50.00  
 95.00' LT  
 75.00' LT

40+00.00  
 95.00' LT  
 55.00' LT

35+50.00 80.00  
 75.00' LT 60.00' LT  
 65.00' LT 50.00' LT

60.00' LT  
 50.00' LT

37+24.44  
 90.00' LT  
 50.00' LT

37+24.43  
 75.00' LT

38+58.00  
 90.00' LT

39+40.00  
 90.00' LT  
 74.62' LT

74.62' LT

REQ'D R/W  
 EXISTING R/W

REQ'D R/W

REQ'D R/W

REQ'D R/W  
 TYPE 12

EXISTING R/W  
 SVA20210  
 WCR GDOT  
 TYPE A

N-924598.93  
 E-2051089.26

N-997111.55  
 E-2051089.26

BEG TAPER  
 E94.62  
 35.56' LT

E-30.50  
 4.57' LT

N-924611.55  
 E-2051688.88

40.00' LT

+45.56  
 8.00' RT

CL CONST.

CURVE KC9

END TAPER  
 E25.12  
 23' LT

WHITTLESEY RD.

N 89°11'31.5" E

DISTRICT 8

L.L. 58  
 L.L. 57

37+00.00  
 60.00' RT  
 88.42  
 34.00' RT

+24.43  
 10.00' RT

23' LT

+2.76  
 38.52' RT

24'

34.00' RT  
 R-35

34.00' RT

24'

24'

18'

REQ'D R/W

REQ'D R/W

REQ'D R/W

REQ'D R/W

REQ'D R/W

35+80.01  
 60.00' RT

35+80.00  
 90.00' RT

36+83.46  
 75.00' RT

36+66.80  
 90.00' RT

37+20.00  
 96.00' RT  
 75.00' RT

37+55.00  
 96.00' RT  
 75.85' RT

38+17.78  
 60.00' RT  
 85.00' RT

38+17.79  
 60.00' RT  
 105.00' RT

WILKINSON, SUE B.  
 & HOKE S. JR.

20

STA 36+39.47 WHITTLESEY RD-  
 STA 10+00.00 CL ASHWOOD

21

DIXON, JOHN C. & MAR

BEGIN CONSTRUCTION  
 STA 9+00.00 CL ASHWOOD

MATCH LINE STA 18+00.00 CL BRADLEY PARK  
 SHEE SHEET 25 OF 24

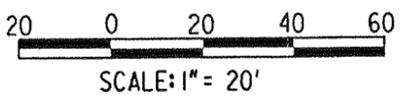
**ALTERNATIVE**

MOTSENBOCKER, ALMA C.

OBSCURED ARE

PROPERTY AND EXISTING R/W LINE	---	BEGIN LIMIT OF ACCESS.....	BLA
REQUIRED R/W LINE	---	END LIMIT OF ACCESS.....	ELA
CONSTRUCTION LIMITS	---	LIMIT OF ACCESS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---	REQUIRED R/W AND LIMIT OF ACCESS	---
EASEMENT FOR CONSTR OF SLOPES	---		
EASEMENT FOR CONSTR OF DRIVES	---		

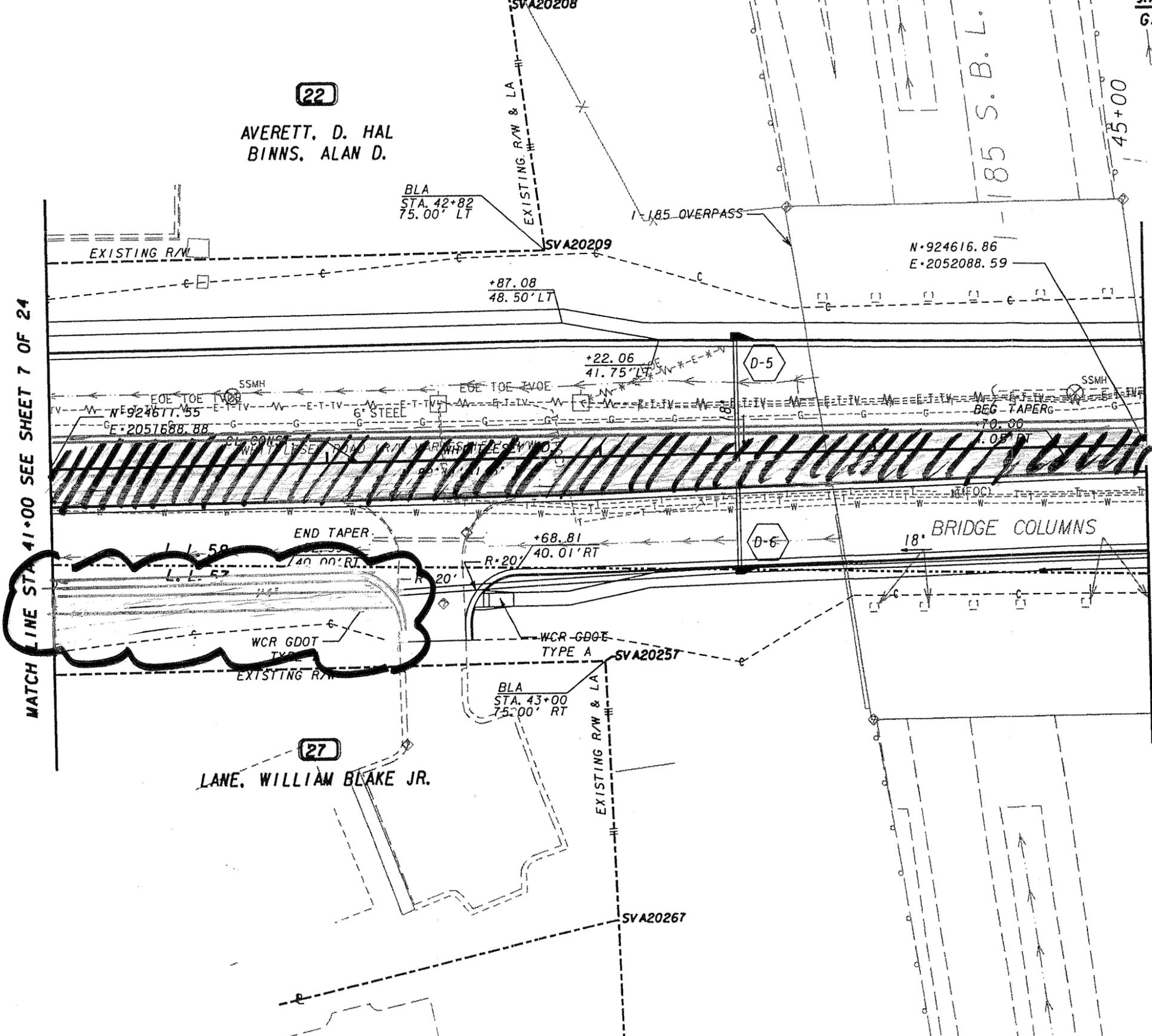
DATE	REVISIONS	DATE	REVISIONS



KISINGER CAMPO &  
 ASSOCIATES CORP.  
 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 7 OF 24

ALT. 7  
**SHEET 6 OF 9**



MATCH LINE STA 41+00 SEE SHEET 7 OF 24

MATCH LINE STA 45+00 SEE SHEET 9 OF 24

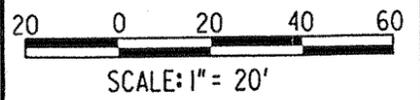
**22**  
 AVERETT, D. HAL  
 BINNS, ALAN D.

**27**  
 LANE, WILLIAM BLAKE JR.

**ALTERNATIVE**

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	▨
EASEMENT FOR CONSTR OF SLOPES	▩
EASEMENT FOR CONSTR OF DRIVES	▣

BEGIN LIMIT OF ACCESS.....BLA  
 END LIMIT OF ACCESS.....ELA  
 LIMIT OF ACCESS  
 REQUIRED R/W AND LIMIT OF ACCESS



DATE	REVISIONS	DATE	REVISIONS

**KISINGER CAMPO & ASSOCIATES CORP.**  
 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 8 OF 24

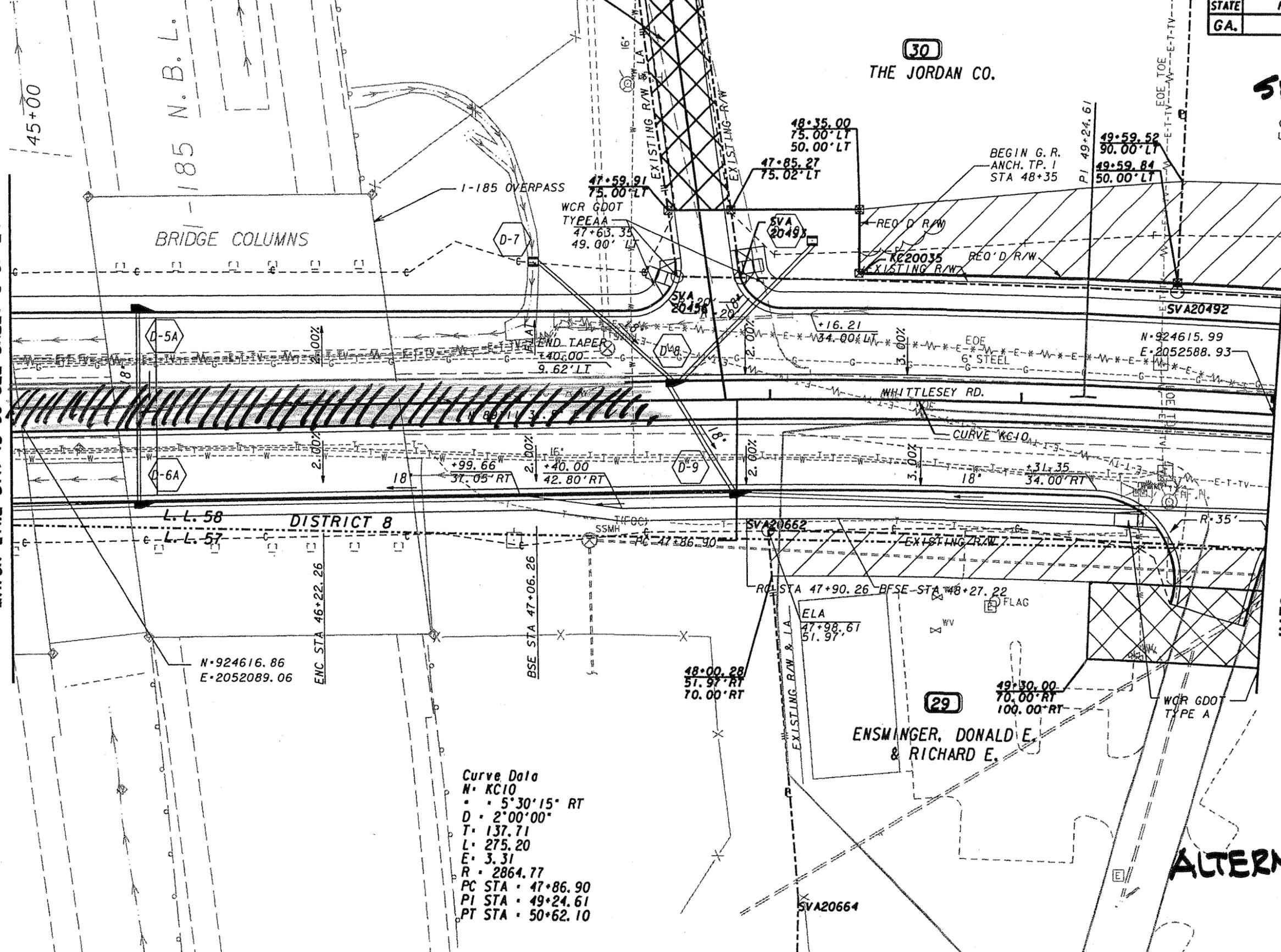
9/7/2007 8:58:42 AM C:\V199990\_25\_muscogee\roadwork\151010.dwg 15/10/10 10:08:40

30  
THE JORDAN CO.

ALT. 7  
SHEET 7 OF 9

MATCH LINE STA 45+00 SEE SHEET 8 OF 24

MATCH LINE STA 50+00 SEE SHEET 10 OF 24

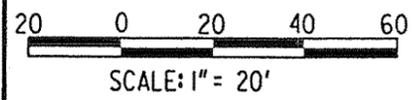


Curve Data  
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 • 5°30'15" RT  
 D: 2'00'00"  
 T: 137.71  
 L: 275.20  
 E: 3.31  
 R: 2864.77  
 PC STA: 47+86.90  
 PI STA: 49+24.61  
 PT STA: 50+62.10

ALTERNATIVE

PROPERTY AND EXISTING R/W LINE  
 REQUIRED R/W LINE  
 CONSTRUCTION LIMITS  
 EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES  
 EASEMENT FOR CONSTR OF SLOPES  
 EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA  
 END LIMIT OF ACCESS.....ELA  
 LIMIT OF ACCESS  
 REQUIRED R/W AND LIMIT OF ACCESS



DATE	REVISIONS	DATE	REVISIONS



GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 9 OF 24

9.7.2007 8:58:44 AM G:\11999900\_26\_muscogee\cond\work\3510101\01.dwg\13510101.dwg

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 7

DESCRIPTION: **CLOSE OFF BRADLEY PARK AT WHITTLESEY ROAD**

SHEET NO.: 8 of 9

Delete Original Paving – both left-turn lanes at median opening and u-turn eye brows on Whittlesey Road and all paving on Bradley Park Drive:

Left Lanes:  $12' \times (165' + 520') = 8,220 \text{ sf/9 sf/sy} = 914 \text{ sy}$   
 Median:  $24' \times 110' = 2,640 \text{ sf/9 sf/sy} = 294 \text{ sy}$   
 U-turns:  $(120' + 140') \times 12' = 3,120 \text{ sf/9 sf/sy} = 347 \text{ sy}$   
 Bradley Park:  $(140' + 60')/2 \times 70' = 7,000 \text{ sf/9 sf/sy} = 778 \text{ sy}$   
 $(60' + 36')/2 \times 471' = 22,608 \text{ sf/9 sf/sy} = 2,512 \text{ sy}$

**TOTAL PAVING = 4,845 sy**

12.5 mm asphalt paving at 165 lb/sy =  $165 \text{ lb/sy} \times 4,845 \text{ sy} / 2,000 \text{ lb/tn} = 400 \text{ tn}$   
 19 mm asphalt paving at 220 lb/sy =  $220 \text{ lb/sy} \times 4,845 \text{ sy} / 2,000 \text{ lb/tn} = 533 \text{ tn}$   
 25 mm asphalt paving at 660 lb/sy =  $660 \text{ lb/sy} \times 4,845 \text{ sy} / 2,000 \text{ lb/tn} = 1,600 \text{ tn}$   
 12" G.A.B at 1,320 lb/sy =  $1,320 \text{ lb/sy} \times 4,845 \text{ sy} / 2,000 \text{ lb/tn} = 3,200 \text{ tn}$

Additional concrete median:  $12' \times (520' + 165' + 110') = 9,540 \text{ sf/9 sf/sy} = 1,060 \text{ sy}$   
 Additional concrete sidewalk:  $160' \times 5' = 800 \text{ sf/9 sf/sy} = 89 \text{ sy}$   
 Additional curb and gutter, TP 7:  $110' \times 2 = 220 \text{ lf}$

Reduction of Orig. ROW:  $(55'/2 \times 40') + (20' \times 160') + [(20'+30')/2 \times 80'] + (30' \times 105') = 9,450 \text{ sf}$   
 Reduction of Orig. Easement:  $[(30' + 20')/2 \times 75'] + (55' \times 25') + (120' \times 15') + (5' \times 110') = 5,600 \text{ sf}$

Reduction of median:  $(350' \times 1') + (14'/2 \times 16') + (14' \times 8') + (6' \times 9') = 628 \text{ sf/9 sf/sy} = 70 \text{ sy}$   
 Reduction of concrete curb and gutter TP 7:  $350' \times 2 = 700 \text{ lf}$   
 Reduction of concrete curb and gutter TP 2:  $70' + 60' + 425' + 470' = 1,025 \text{ lf}$

Reduction of drainage storm drain pipe 18":  $60' + 62' + 50' + 40' + 108' + 150' + 50' = 520 \text{ lf}$   
 Reduction of sidewalk:  $(520' + 200' + 95' + 110') \times 5' = 4,625 \text{ sf/9 sf/sy} = 514 \text{ sy}$

Reduction of erosion control (% of total cost – Bradley Park Dr. = 0.104 mile); project length = 1.089 miles.  
 Total erosion control cost/project = \$315,707;  $\therefore (0.104/1.089) \times 100 = \mathbf{9.565 \% (0.09565)}$   
 Total erosion control cost reduction =  $\$315,707 \times 0.0956 = \$30,198$

Total signing and marking reduction =  $\$148,540 \times 0.0956 = \$14,200$

Clearing and grubbing reduction =  $\$320,000 \times 0.0956 = \$30,592$

# COST WORKSHEET



PROJECT: **STP-8060(2), P.I. No. 351010 & STP-0005-00(749), P.I. NO. 0005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO: 7

SHEET NO.: 9 of 9

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Concrete Curb and Gutter; TP 7	lf	700	15.02	10,514	220	15.02	3,304
Asphalt Conc. - 12.5 mm	tn	400	75.00	30,000			
Asphalt Conc. - 19 mm	tn	533	75.00	39,975			
Asphalt Conc. - 25 mm	tn	1,600	75.00	120,000			
GAB -12"	tn	3,200	19.98	63,936			
Concrete Median	sy	70	54.31	3,802	1,060	54.31	57,569
Concrete Sidewalk	sy	514	33.67	17,306	89	33.67	2,997
Concrete Curb and Gutter; TP 2	lf	1,025	19.04	19,516			
18" Storm Drain Pipe	lf	520	45.96	23,899			
Catch Basin, GP 1	ea	4	2,784.43	11,138			
Drop Inlet, GP 1	ea	3	3,987.53	11,963			
Strain poles	ea	4	7,218.58	28,874			
Traffic signal	ls	1	49,530.77	49,531			
Signal timing	ls	1	48,039.50	48,040			
Pull boxes	ea	2	1,562.89	3,126			
Clearing and Grubbing	ls	1	30,198	30,198			
Erosion Control	ls	1	14,200	14,200			
Sign and marking	ls	1	30,592	30,592			
Construction Subtotal				556,609			63,870
Construction Markup at 25.86%				143,939			16,517
Construction Total				700,548			80,386
Commercial R/W	SF	9,450	16.00	151,200			
Commercial Easement	SF	5,600	8.00	44,800			
ROW Subtotal				196,000			
ROW Markup at 247.20%				484,512			
ROW Total				680,512			
<b>Sub-total</b>				1,381,060			80,386
<b>Mark-up at</b>				Included			Included
<b>TOTAL</b>				1,381,060			80,386

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **8**

DESCRIPTION: **ALLOW RIGHT-IN/RIGHT-OUT ONLY AT  
BRADLEY PARK DRIVE**

SHEET NO.: **1 of 9**

**ORIGINAL DESIGN:** (Sketch attached)

The current design calls for left-turn lanes in both the EB and WB directions onto Bradley Park Drive from the mainline. These turning movements service the commercial/business areas on the east side of Bradley Park Drive.

**ALTERNATIVE:** (Sketch attached)

Eliminate both EB and WB left-turning lanes from the mainline onto Bradley Park Drive. Allow EB right-in/right-out onto Bradley Park Drive from Whittlesey Road.

**ADVANTAGES:**

- Improves safety
- Reduces construction and right-of-way costs
- Lessens impacts to parcel 27
- Reduces through traffic on Bradley Park
- Through traffic to use Whittlesey Road or Whitesville Parkway

**DISADVANTAGES:**

- Limits access to businesses and residents
- Lengthens alternate route

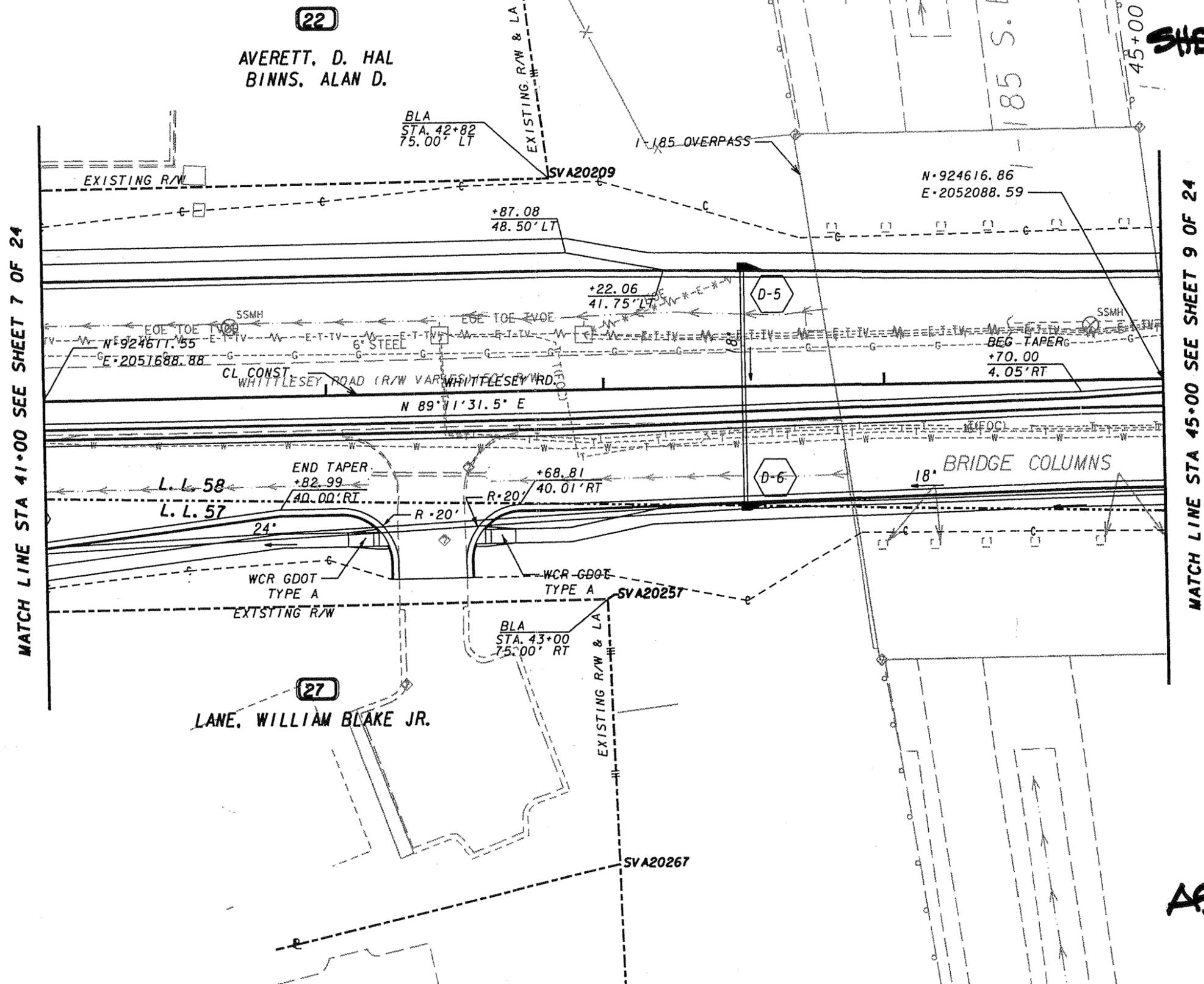
**DISCUSSION:**

Bradley Park Drive serves primarily a commercial/business community on the east side of Bradley Park Drive. Allowing right-in/right-out only would eliminate southbound traffic from using Bradley Park Drive as a through street. Traffic could use the new Whittlesey Road or Whiteville Parkway as alternate routes. This would also eliminate the existing/proposed traffic signal.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,352,207	—	\$ 1,352,207
ALTERNATIVE	\$ 81,070	—	\$ 81,070
SAVINGS	\$ 1,271,137	—	\$ 1,271,137



**ALT 8**  
**SHEET 3 OF 9**



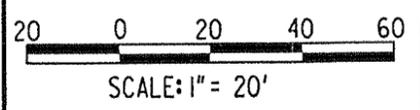
MATCH LINE STA 41+00 SEE SHEET 7 OF 24

MATCH LINE STA 45+00 SEE SHEET 9 OF 24

**AS DESIGNED**

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....	BLA
END LIMIT OF ACCESS.....	ELA
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS



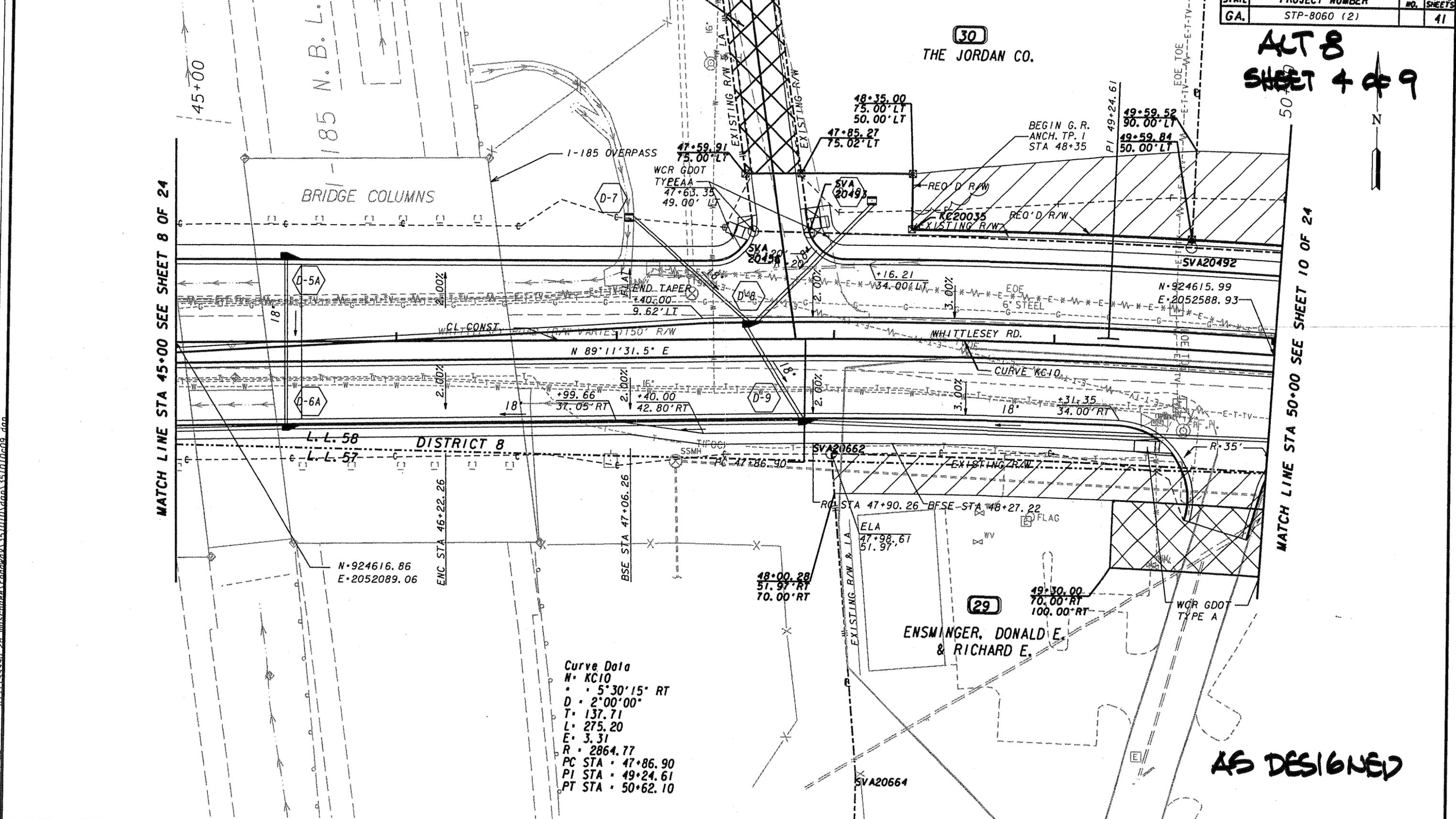
**KISINGER CAMPO & ASSOCIATES CORP.**  
1720 PEACHTREE ST., N.W., SUITE 1048  
ATLANTA, GA 30309

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE  
DATE 4-14-06 SH 8 OF 24

9/7/2007 R-58-42 AM C:\1199990\_26\_muscogee\roadway\151010\draw\151010a02.dwg

ALT 8  
SHEET 4 OF 9

30  
THE JORDAN CO.



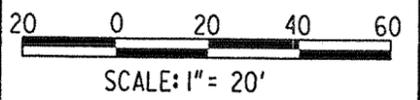
MATCH LINE STA 45+00 SEE SHEET 8 OF 24

MATCH LINE STA 50+00 SEE SHEET 10 OF 24

AS DESIGNED

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....	BLA
END LIMIT OF ACCESS.....	ELA
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS

KISINGER CAMPO & ASSOCIATES CORP.  
1720 PEACHTREE ST., N.W., SUITE 1046  
ATLANTA, GA 30309

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE  
DATE 4-14-06 SH 9 OF 24

ALT. 8

22 SHEET 3 OF 9

AVERETT, D. HAL  
BINNS, ALAN D.

STA. 39+98.17 WHITTLESEY RD.  
STA. 19+10.06 CL BRADLEY PARK

STN. DUMP RIP RAP TP 1  
24 IN THICK

WETLAND

18  
NORTHSIDE CHAPEL  
CHURCH OF GOD  
OF PROPHECY

BEGIN G. R.  
ANCH. TP. 1  
STA 37+25  
REQ'D R/W

39-50.00  
95.00' LT  
75.00' LT

40-00.00  
95.00' LT  
75.00' LT

40-15.73  
74.62' LT

35-50.00 80.00  
75.00' LT 60.00' LT  
65.00' LT 50.00' LT

37-24.44  
90.00' LT  
50.00' LT

37-24.43  
75.00' LT

38-58.00  
90.00' LT

39-40.00  
90.00' LT  
74.62' LT

ROARING BRANCH CREEK

126' DOUBLE 7' x 6'  
BOX CULVERT

WCR GDOT  
TYPE A

EXISTING R/W

WCR GDOT  
TYPE A

MATCH LINE STA 35+00 SEE SHEET 6 OF 24

MATCH LINE STA 41+00 SEE SHEET 8 OF 24

DISTRICT 8

L. L. 58

L. L. 57

BEG TAPER  
94.162

35.56' LT

N 89° 11' 31.5" E  
WHITTLESEY RD.

N-924611.55  
E-2051688.88

+45.56  
8.00' RT

+45.56  
16.00' RT

+45.56  
52.00' RT

+45.56  
16.00' RT

+45.56  
52.00' RT

+45.56  
16.00' RT

+45.56  
52.00' RT

37-00.00  
60.00' RT  
85.42

34.00' RT

+24.43  
10.00' RT

24'

25.12  
23' LT

24'

14'

18'

18'

18'

18'

18'

18'

18'

18'

18'

36-83.46  
75.00' RT

36-66.80  
90.00' RT

37-20.00  
96.00' RT  
75.00' RT

37-55.00  
96.00' RT  
75.85' RT

37-50.00  
75.00' RT

38-17.78  
60.00' RT  
85.00' RT

38-17.79  
60.00' RT  
105.00' RT

39-43.73  
90.00' RT

ALT. 8

# SHEET 6 OF 9



22

AVERETT, D. HAL  
BINNS, ALAN D.

BLA  
STA. 42+82  
75.00' LT

185 OVERPASS

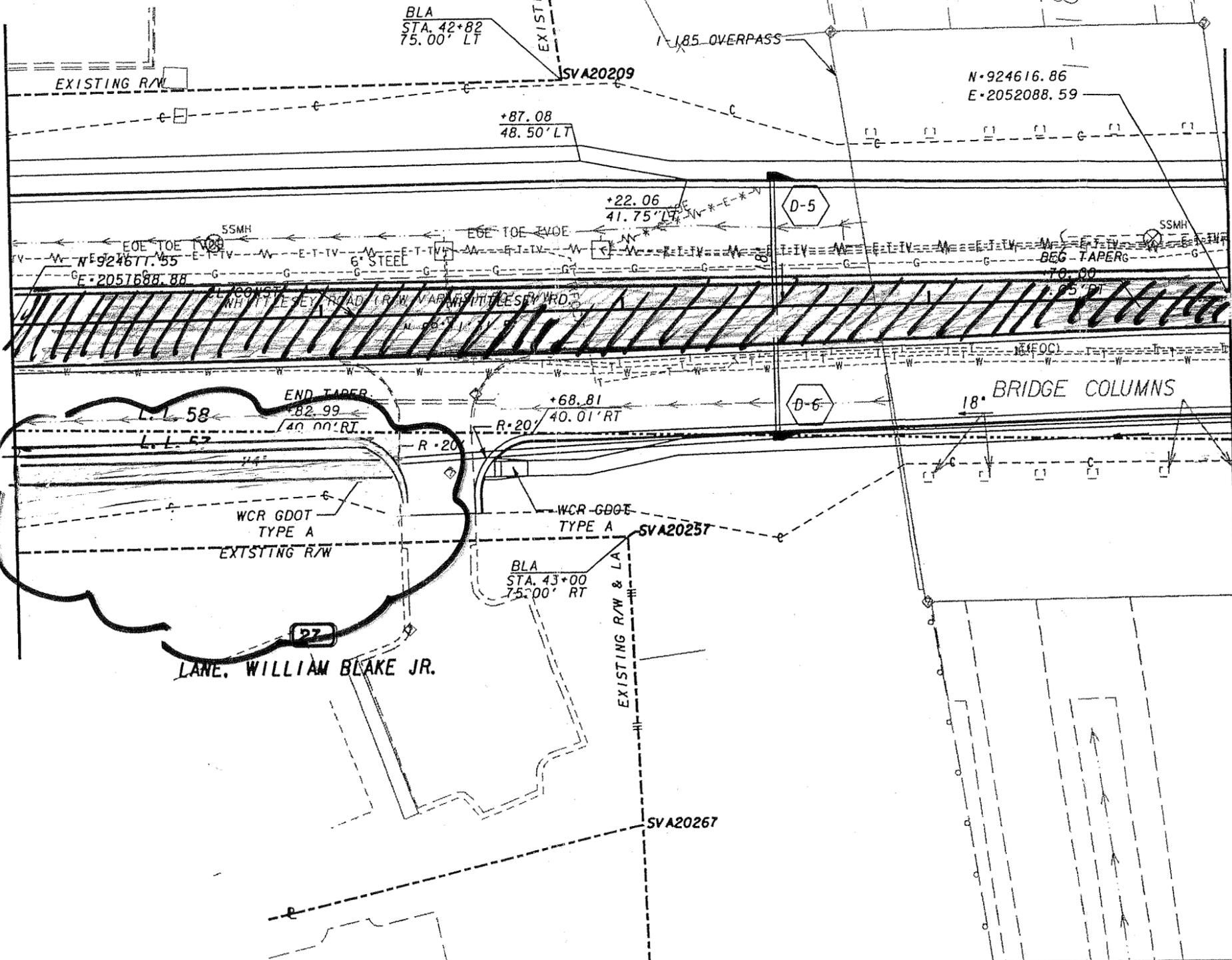
N=924616.86  
E=2052088.59

+87.08  
48.50' LT

+22.06  
41.75' LT

MATCH LINE STA 41+00 SEE SHEET 7 OF 24

MATCH LINE STA 45+00 SEE SHEET 9 OF 24



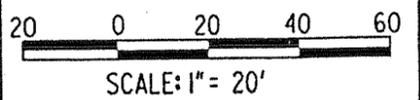
LANE. WILLIAM BLAKE JR.

18' BRIDGE COLUMNS

## ALTERNATIVE

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES	▨
EASEMENT FOR CONSTR OF SLOPES	▩
EASEMENT FOR CONSTR OF DRIVES	▣

BEGIN LIMIT OF ACCESS.....BLA  
 END LIMIT OF ACCESS.....ELA  
 LIMIT OF ACCESS  
 REQUIRED R/W AND LIMIT OF ACCESS

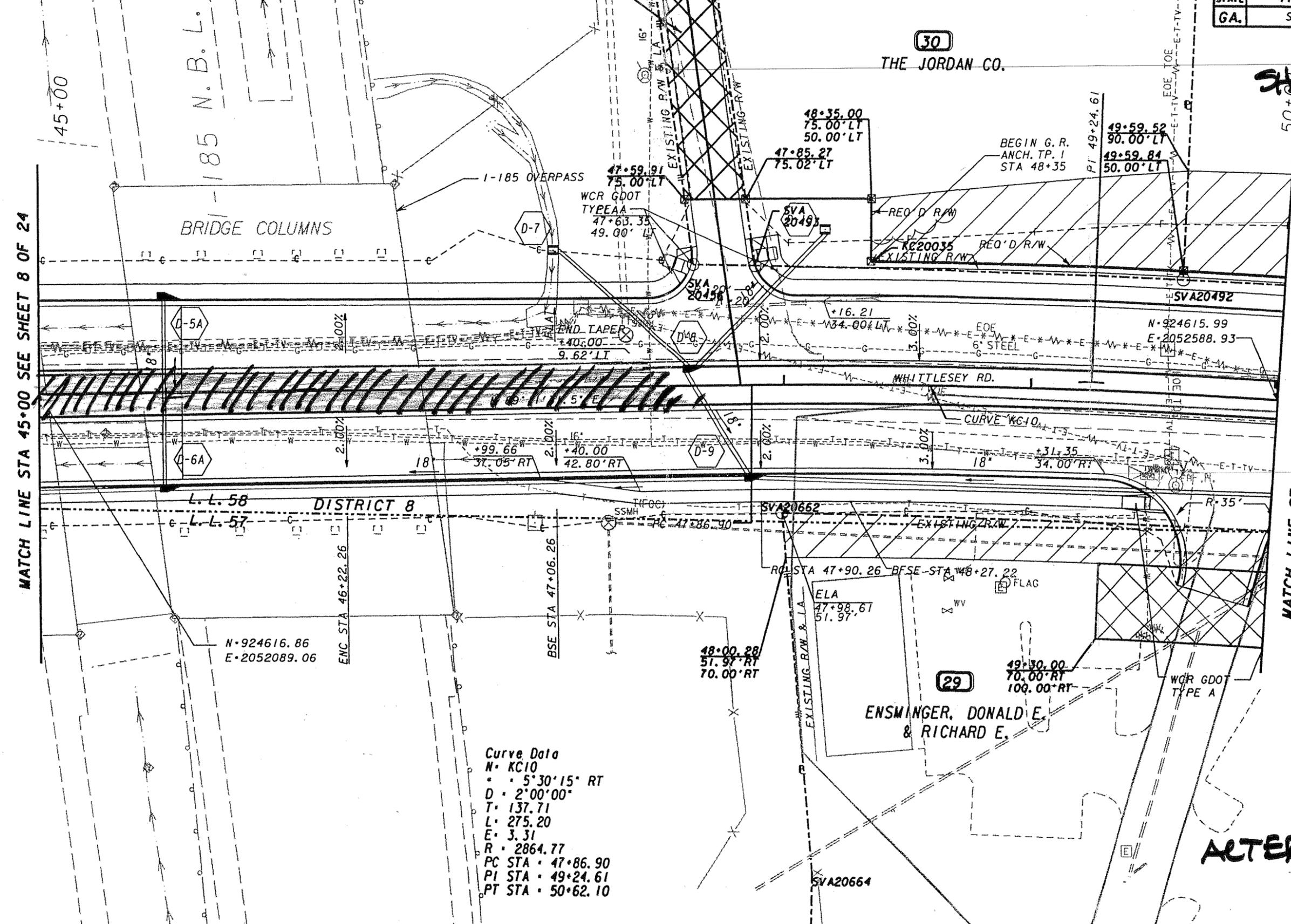


DATE	REVISIONS	DATE	REVISIONS



GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 8 OF 24

ALT. 8  
**SHEET 7 OF 9**



MATCH LINE STA 45+00 SEE SHEET 8 OF 24

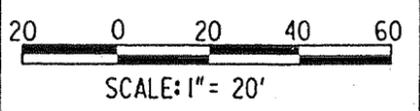
MATCH LINE STA 50+00 SEE SHEET 10 OF 24

**Curve Data**  
 N: KC10  
 D: 5°30'15" RT  
 T: 2'00'00"  
 L: 137.71  
 E: 275.20  
 R: 3.31  
 PC STA: 47+86.90  
 PI STA: 49+24.61  
 PT STA: 50+62.10

**ALTERNATIVE**

PROPERTY AND EXISTING R/W LINE ---e---  
 REQUIRED R/W LINE ————  
 CONSTRUCTION LIMITS —C—F—  
 EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES [Hatched Box]  
 EASEMENT FOR CONSTR OF SLOPES [Diagonal Lines Box]  
 EASEMENT FOR CONSTR OF DRIVES [Cross-hatched Box]

BEGIN LIMIT OF ACCESS.....BLA  
 END LIMIT OF ACCESS.....ELA  
 LIMIT OF ACCESS ————  
 REQUIRED R/W AND LIMIT OF ACCESS [Double Line]



DATE	REVISIONS	DATE	REVISIONS

**KISINGER CAMPO & ASSOCIATES CORP.**  
 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE 4-14-06 SH 9 OF 24



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **8**

DESCRIPTION: **ALLOW RIGHT-IN/RIGHT-OUT ONLY AT  
BRADLEY PARK DRIVE**

SHEET NO.: **8 of 9**

Delete original paving – both left-turn lanes at median opening and u-turn eye brows on Whittlesey Road and all paving on Bradley Park Drive:

Left Lanes:  $12' \times (165' + 520') = 8,220 \text{ sf}/9 \text{ sf/sy} = 914 \text{ sy}$

Median:  $24' \times 110' = 2,640 \text{ sf}/9 \text{ sf/sy} = 294 \text{ sy}$

U-turns:  $(120' + 140') \times 12' = 3,120 \text{ sf}/9 \text{ sf/sy} = 347 \text{ sy}$

Bradley Park Drive:  $(90')/2 \times 70' = 3,150 \text{ sf}/9 \text{ sf/sy} = 350 \text{ sy}$

$(60' + 36')/2 \times 471' = 22,608 \text{ sf}/9 \text{ sf/sy} = 2,512 \text{ sy}$

**TOTAL PAVING = 4417 sy**

12.5 mm asphalt paving at 165 lb/sy =  $165 \text{ lb/sy} \times 4,417 \text{ sy}/2,000 \text{ lb/tn} = 365 \text{ tn}$

19 mm asphalt paving at 220 lb/sy =  $220 \text{ lb/sy} \times 4,417 \text{ sy}/2,000 \text{ lb/tn} = 486 \text{ tn}$

25 mm asphalt paving at 660 lb/sy =  $660 \text{ lb/sy} \times 4,417 \text{ sy}/2,000 \text{ lb/tn} = 1,458 \text{ tn}$

12" G.A.B at 1,320 lb/sy =  $1,320 \text{ lb/sy} \times 4,417 \text{ sy}/2,000 \text{ lb/tn} = 2,916 \text{ tn}$

Additional concrete median:  $12' \times (520' + 165' + 110') + (12'/2 \times 14') = 9,624 \text{ sf}/9 \text{ sf/sy} = 1,070 \text{ sy}$

Additional concrete sidewalk:  $160' \times 5' = 800 \text{ sf}/9 \text{ sf/sy} = 89 \text{ sy}$

Additional curb and gutter, TP 7:  $110' \times 2 = 220 \text{ lf}$

Reduction of original ROW:  $(55'/2 \times 40') + (20' \times 160') + [(20'+30')/2 \times 80'] + (30' \times 105') = 9,450 \text{ sf}$

Reduction of original easement:  $[(30'+20')/2 \times 75'] + (55' \times 25') + (120' \times 15') + (5' \times 110') = 5,600 \text{ sf}$

Reduction of median:  $(350' \times 1') + (14'/2 \times 16') + (14' \times 8') + (6' \times 9') = 628 \text{ sf}/9 \text{ sf/sy} = 70 \text{ sy}$

Reduction of concrete curb and gutter TP 7:  $350' \times 2 = 700 \text{ lf}$

Reduction of concrete curb and gutter TP 2:  $70' + 60' + 425' + 470' = 1,025 \text{ lf}$

Reduction of drainage storm drain pipe 18":  $60' + 62' + 50' + 40' + 108' + 150' + 50' = 520 \text{ lf}$

Reduction of sidewalk:  $(520' + 200' + 95' + 110') \times 5' = 4,625 \text{ sf}/9 \text{ sf/sy} = 514 \text{ sy}$

Reduction of erosion control (percent of total cost – Bradley Park Dr. = 0.104 mile)

Project length = 1.089 miles; total erosion control cost/project = \$315,707

$(0.104/1.089) \times 100 = 9.565 \% (0.09565)$

Total erosion control cost reduction =  $\$315,707 \times 0.0956 = \$30,198$

Total signing and marking reduction =  $\$148,540 \times 0.0956 = \$14,200$

Clearing and grubbing reduction =  $\$320,000 \times 0.0956 = \$30,592$

# COST WORKSHEET



PROJECT: **STP-8060(2), P.I. No. 351010 & STP-0005-00(749), P.I. No. 0005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO: 8

SHEET NO.: 9 of 9

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Concrete Curb and Gutter, TP 7	lf	700	15.02	10,514	220	15.02	3,304
Asphalt Conc. - 12.5 mm	tn	365	75.00	27,375			
Asphalt Conc. - 19 mm	tn	486	75.00	36,450			
Asphalt Conc. - 25 mm	tn	1,452	75.00	108,900			
GAB -12"	tn	2,916	19.98	58,262			
Concrete Median	sy	70	54.31	3,802	1,070	54.31	58,112
Concrete Sidewalk	sy	514	33.67	17,306	89	33.67	2,997
Concrete Curb and Gutter, TP 2	lf	1,025	19.04	19,516			
18" Storm Drain Pipe	lf	520	45.96	23,899			
Catch Basin, GP 1	ea	4	2,784.43	11,138			
Drop Inlet, GP 1	ea	3	3,987.53	11,963			
Strain poles	ea	4	7,218.58	28,874			
Traffic signal	ls	1	49,530.77	49,531			
Signal timing	ls	1	48,039.50	48,040			
Pull boxes	ea	2	1,562.89	3,126			
Clearing and Grubbing	ls	1	30,198.00	30,198			
Erosion Control	ls	1	14,200.00	14,200			
Sign and marking	ls	1	30,592.00	30,592			
Construction Subtotal				533,685			64,413
Construction Markup at 25.86%				138,011			16,657
Construction Total				671,695			81,070
Commercial Right-of-Way	sf	9,450	16.00	151,200		16.00	
Commercial Easement	sf	5,600	8.00	44,800		8.00	
ROW Subtotal				196,000			
ROW Markup at 247.20%				484,512			
ROW Total				680,512			
<b>Sub-total</b>				1,352,207			81,070
<b>Mark-up at</b>				Included			Included
<b>TOTAL</b>				1,352,207			81,070

# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **9**

DESCRIPTION: **ELIMINATE THE WEST END OF THE PROJECT FROM  
WHITESVILLE PARKWAY TO BRADLEY PARK DRIVE**

SHEET NO.: **1 of 3**

## ORIGINAL DESIGN:

The current design calls for improvements to Whittlesey Road from the Whittlesey Road/Whiteville Parkway intersection to the Whittlesey Road/Bradley Park Drive intersection. The last 0.27 miles of these improvements is project STP-0005-00(749), while the remaining 0.052 miles is under project STP-8060(2).

## ALTERNATIVE:

Eliminate the entire west end of the project and improve the remaining intersections at Whittlesey Road/Whiteville Parkway and Whittlesey Road/Bradley Park Drive.

## ADVANTAGES:

- Improves safety
- Reduces costs
- Uses an existing roadway

## DISADVANTAGES:

- Increases traffic volume on Whitesville Parkway
- Requires intersection improvement at Whitesville Parkway and Bradley Park Drive
- Eliminates further improvements along the west end of Whittlesey Road

## DISCUSSION:

This alternative provides a more direct route from the beginning of the project at Bradley Park Drive to the end of the project near Veterans Parkway and the business areas. This will use the existing parkway and minimize congestion on Bradley Park Drive from Whitesville Parkway to Whittlesey Road.

Acknowledging the fact that Whittlesey Road adjacent to the car dealerships at the west end of the project would not be widened beyond the existing three-lane facility with a flush median, the condition does not warrant a major re-work. Its appears that Whitesville Parkway and Whittlesey Road combined can accommodate anticipated increase to traffic volumes without the additional re-work of Whittlesey Road.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 15,830,587	—	\$ 15,830,587
ALTERNATIVE	\$ 2,286,180	—	\$ 2,286,180
SAVINGS	\$ 13,544,407	—	\$ 13,544,407

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 9

DESCRIPTION: **ELIMINATE THE WEST END OF THE PROJECT FROM  
WHITESVILLE PARKWAY TO BRADLEY PARK DRIVE**

SHEET NO.: 2 of 3

**TOTAL PROJECT LENGTH = 1.089 miles**

Roadway cost = \$10,049,718/1.089 miles = \$9,228,391/mile

Erosion control cost = \$315,708/1.089 miles = \$289,906/mile

Traffic signs and markings = \$138,540/1.089 miles = \$127,217/mile

Right-of-Way Cost = \$6,438,430/1.089 miles = \$5,912,241/mile

**ROAD REDUCTION = 0.322**

Roadway cost reduction = 0.322 x \$9,228,391/mile = \$2,971,542

Erosion control cost reduction = 0.322 x \$289,906/mile = \$93,350

Traffic signs and markings cost reduction = 0.322 x \$127,217/mile = \$40,964

Right-of-Way cost reduction = 0.322 x \$5,912,241/mile = \$1,903,742

**ELIMINATE STP-0005-00(749) IN ITS ENTIRETY = 0.27 MILES**



# VALUE ENGINEERING ALTERNATIVE



PROJECT:	<b>STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD Muscogee County, GDOT</b>	ALTERNATIVE NO.:	11
DESCRIPTION:	<b>IF ALTERNATIVE NOS. 4 AND 7 ARE ACCEPTED, USE A NARROWER MEDIAN FROM VETERANS PARKWAY TO WHITESVILLE PARKWAY</b>	SHEET NO.:	1 of 3

**ORIGINAL DESIGN:**

The current design calls for the use of a 20-foot raised median throughout the majority of the project.

**ALTERNATIVE:**

If Alternative Nos. 4 and 7 are accepted, the remaining median that could be reduced is about 0.492 miles. As such, this alternative would reduce the median by 10 feet in this remaining area.

**ADVANTAGES:**

- Improves safety
- Reduces construction costs
- Reduces right-of-way impacts and costs

**DISADVANTAGES:**

- Reduces traffic separation

**DISCUSSION:**

By eliminating the left-turn movements through this section, a wider median is not needed for left-turn storage. Right-of-way impacts and travel time will be reduced as a result of this narrowing.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,832,508	—	\$ 1,832,508
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 1,832,508	—	\$ 1,832,508

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 11

DESCRIPTION: **IF ALTERNATIVE NOS. 4 AND 7 ARE ACCEPTED, USE A  
NARROWER MEDIAN FROM VETERANS PARKWAY TO  
WHITESVILLE PARKWAY**

SHEET NO.: 2 of 3

Begin narrow median at STA 30+00 to SAT 56+00:  $2,600 \text{ lf} / 5,280 \text{ lf/mile} = 0.492 \text{ miles}$

Reduction of median:  $10 \text{ lf} \times 2,600 \text{ lf} / 9 \text{ sf/sy} = 2,890 \text{ sy}$

Reduction of Right of Way:  $10 \text{ lf} \times 2,600 \text{ lf} = 26,000 \text{ sf}$

Reduction of pavement:  $10 \text{ lf} \times 2,600 \text{ lf} / 9 \text{ sf/sy} = 2,890 \text{ sy}$

12.5 mm asphalt paving at 165 lb/sy:  $165 \text{ lb/sy} \times 2,890 \text{ sy} / 2,000 \text{ lb/tn} = 239 \text{ tn}$

19 mm asphalt paving at 220 lb/sy:  $220 \text{ lb/sy} \times 2,890 \text{ sy} / 2,000 \text{ lb/tn} = 318 \text{ tn}$

25 mm asphalt paving at 660 lb/sy:  $660 \text{ lb/sy} \times 2,890 \text{ sy} / 2,000 \text{ lb/tn} = 954 \text{ tn}$

12" G.A.B at 1,320 lb/sy:  $1,320 \text{ lb/sy} \times 2,890 \text{ sy} / 2,000 \text{ lb/tn} = 1,908 \text{ tn}$



# VALUE ENGINEERING ALTERNATIVE



**PROJECT:** STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
**P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
 WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 13/14

**DESCRIPTION:** USE A 14-FOOT FLUSH MEDIAN THROUGHOUT THE  
**PROJECT**

SHEET NO.: 1 of 3

**ORIGINAL DESIGN:**

The current design calls for a 20-foot raised median throughout the project.

**ALTERNATIVE:**

Use a 14-foot flush median throughout the project.

**ADVANTAGES:**

- Improves safety
- Reduces construction costs
- Reduces right-of-way impacts and costs
- No restrictive left-turns

**DISADVANTAGES:**

- Reduces traffic separation
- Creates left-turn conflicts
- Reduces safety

**DISCUSSION:**

By eliminating the raised median, right-of-way impacts are reduced. In addition, travel time can be reduced while permitting unlimited left-turn movements.

It is acknowledged that this project, with its projected increase in traffic volume and a design speed of 45 miles per hours (mph), is at the maximum cusp of using a flush median. It is noted that the speed limit on the existing and future facility is 35 mph. Since the volumes are rather high and the signed speed limit will remain at 35 mph, consideration should be given to design the facility for 35 mph, thereby making this alternative more feasible.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,216,666	—	\$ 3,216,666
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 3,216,666	—	\$ 3,216,666

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 13/14

DESCRIPTION: **USE A 14-FOOT FLUSH MEDIAN THROUGH OUT THE  
PROJECT**

SHEET NO.: 2 of 3

Flush median: STA 11+00 to STA 61+00 = 5,000 lf/5,280 lf/mile = 0.947 miles

Reduction of right-of-way: 6 lf x 5,000 lf = 30,000 sf

Reduction of pavement: 6 lf x 5,000 lf/9 sf/sy = 3,334 sy

12.5 mm asphalt paving at 165 lb/sy: 165 lb/sy x 3,334 sy/2,000 lb/tn = 275 tn

19 mm asphalt paving at 220 lb/sy: 220 lb x 3,334 sy/2,000 lb/tn = 367 tn

25 mm asphalt paving at 660 lb/sy: 660 lb/sy x 3,334 sy/2,000 lb/tn = 1,101 tn

12" G.A.B at 1,320 lb/sy: 1,320 lb/sy x 3,334 sy/2,000 lb/tn = 2,201 tn

Percentage of extension of project (Unit 749) to Bradley Parkway:

Total width including 20-foot median: 68 lf

Total width including 14-foot median: 62 lf

Percentage of reduction:  $(62 \text{ lf}/68 \text{ lf}) - 1 = 0.0882$  (8.82%)

Unit 749 construction:  $\$2,996,000 \times 0.0882 = \$264,353$

Unit 749 right-of-way:  $\$443,836 \times 0.0882 = \$39,146$



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **15**

DESCRIPTION: **USE PARAPET RETAINING WALLS IN LIEU OF GRAVITY  
WALLS WITH HANDRAILS**

SHEET NO.: **1 of 3**

**ORIGINAL DESIGN:**

The design documents indicate the use of gravity walls with handrails at specific locations.

**ALTERNATIVE:** (Sketch attached)

Use parapet type retaining walls in lieu of the proposed gravity walls.

**ADVANTAGES:**

- Improves safety
- Reduces initial cost
- Requires less maintenance

**DISADVANTAGES:**

- None apparent

**DISCUSSION:**

Either retaining wall types would perform the basic function; however, the parapet type retaining wall will perform the function at a reduced cost.

For calculation purposes, it was assumed that all Class B Concrete in the construction cost estimate was gravity retaining walls.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 910,937	—	\$ 910,937
ALTERNATIVE	\$ 742,574	—	\$ 742,574
SAVINGS	\$ 168,363	—	\$ 168,363





# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 17

DESCRIPTION: **USE A MONOLITHIC MEDIAN POUR WHERE EXISTING  
PAVEMENT IS RETAINED**

SHEET NO.: 1 of 2

## ORIGINAL DESIGN:

The design documents indicate the use of a 4-inch-thick raised median with Type 7 concrete curb and gutters.

## ALTERNATIVE:

Use a 7½-inch median at areas where the existing pavement is retained in lieu of the 4-inch median with Type 7 concrete curb and gutter.

## ADVANTAGES:

- Reduces construction cost
- Constructs median in one operation
- Simplifies design and construction
- Reduces construction time
- Takes advantage of existing pavement

## DISADVANTAGES:

- Matching existing grades is slightly more complicated
- Employs two types of medians within the same project

## DISCUSSION:

In addition to the cost savings associated with the curb and gutter, this alternative takes advantage of an existing asset, mainly the existing pavement of the facility. Not only does it simplify design and construction, but having a single pour reduces construction time and completes the median in one operation rather than several segments.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 264,658	—	\$ 264,658
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 264,658	—	\$ 264,658



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: 18

DESCRIPTION: **USE A PRECAST ARCH STRUCTURE IN LIEU OF BOX  
CULVERT**

SHEET NO 1 of 10

**ORIGINAL DESIGN:**

The design documents show the use of twin concrete box culverts spanning Roaring Branch Creek.

**ALTERNATIVE:** (Sketch attached)

Use a Con/Span<sup>®</sup> type arch culvert to bridge over the creek in lieu of the twin concrete culverts.

**ADVANTAGES:**

- Replaces existing structure more quickly
- Assists stage construction
- Protects stream ecology
- Improves stream hydrology

**DISADVANTAGES:**

- Increases initial costs

**DISCUSSION:**

Using a prefabricated Con/Span<sup>®</sup> type structure will save construction time/schedule and assist in staging the construction. The use of these arches will also protect the stream buffer and the ecology thereof which could outweigh the additional cost incurred.

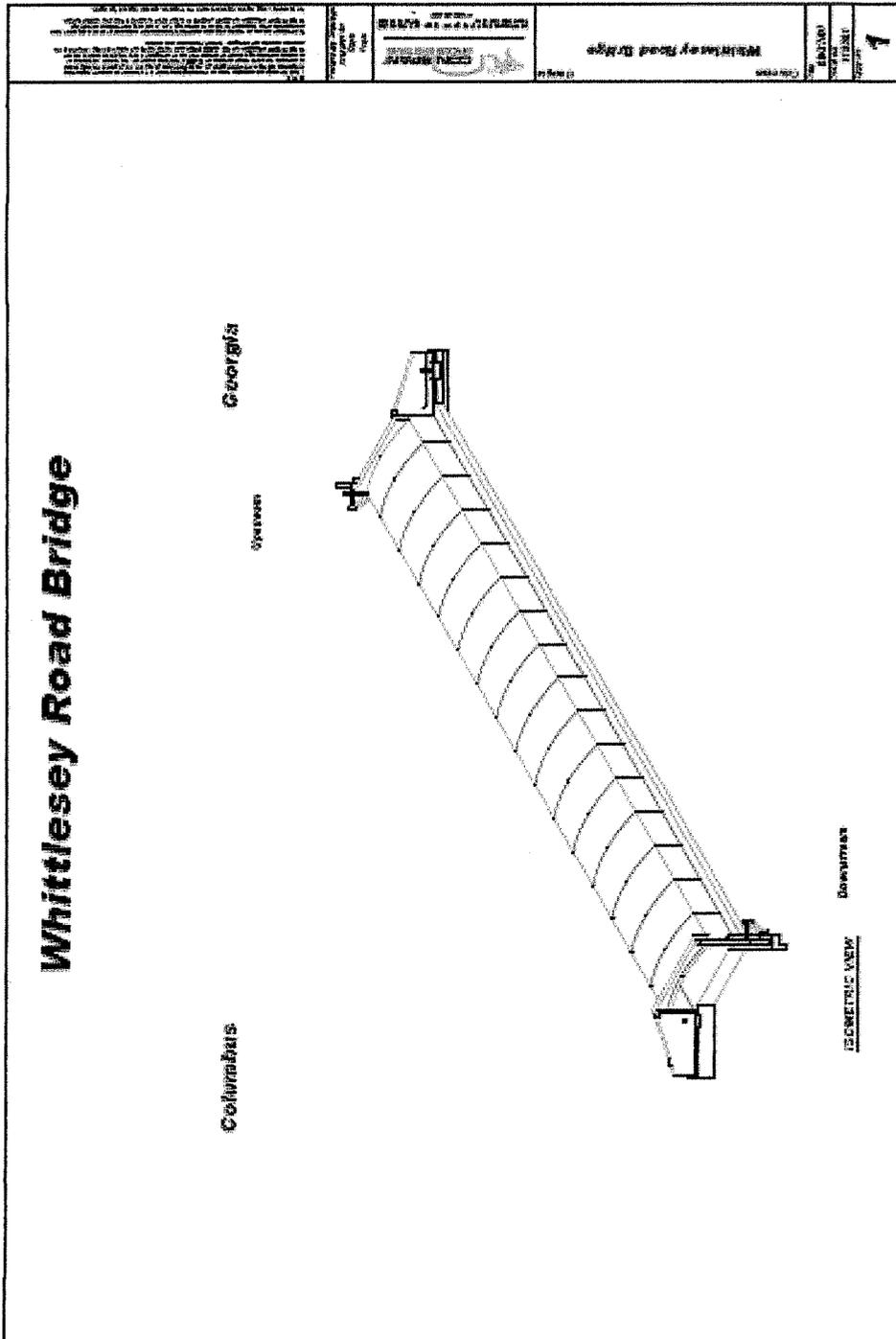
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 169,953	—	\$ 169,953
ALTERNATIVE	\$ 194,050	—	\$ 194,050
SAVINGS	\$ (25,097)	—	\$ (25,097)

PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
 Muscogee County, Georgia Department of Transportation, District 3  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED       ALTERNATIVE

SHEET NO.: 2 of 10



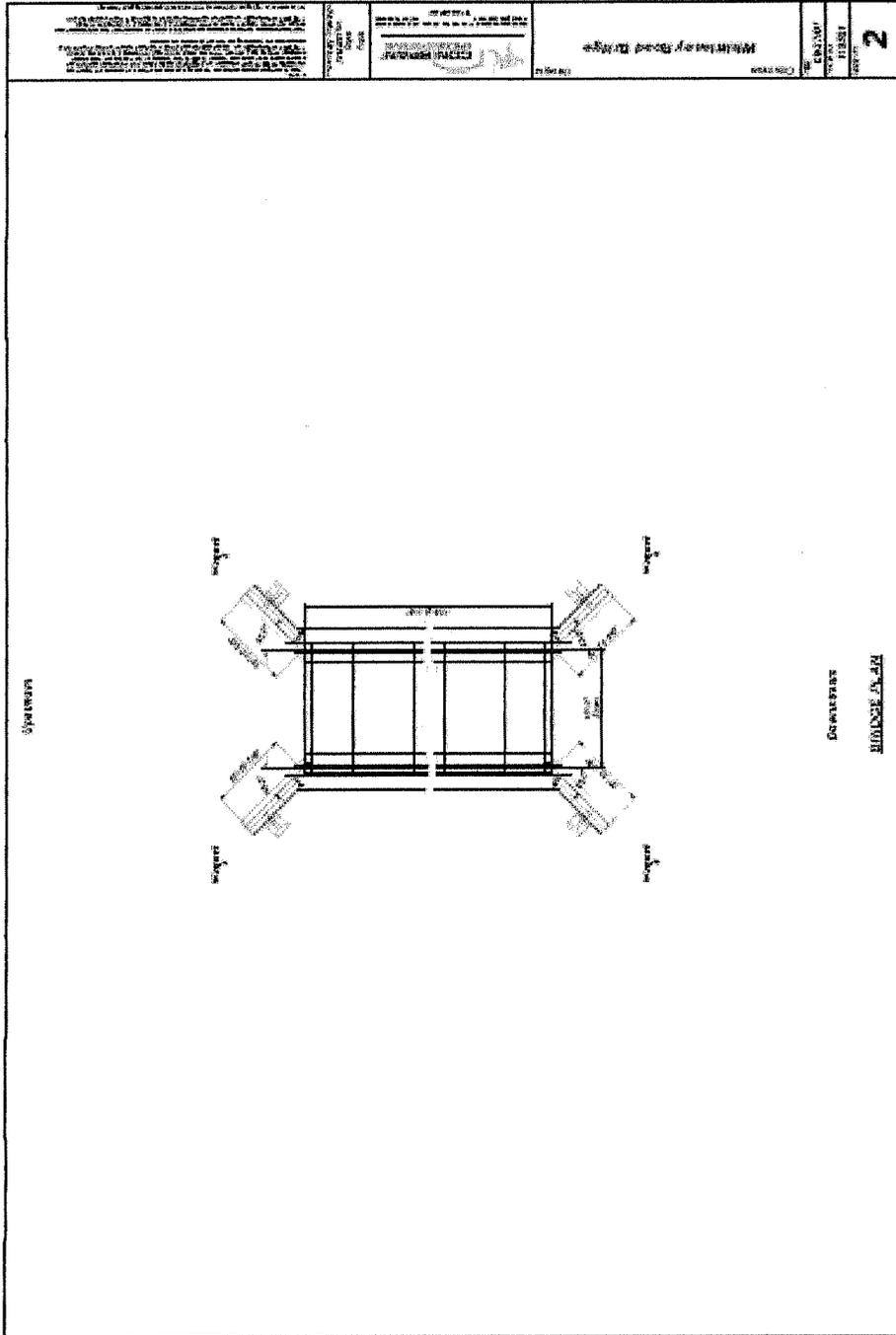


PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
**Muscogee County, Georgia Department of Transportation, District 3**  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED       ALTERNATIVE

SHEET NO.: 3 of 10



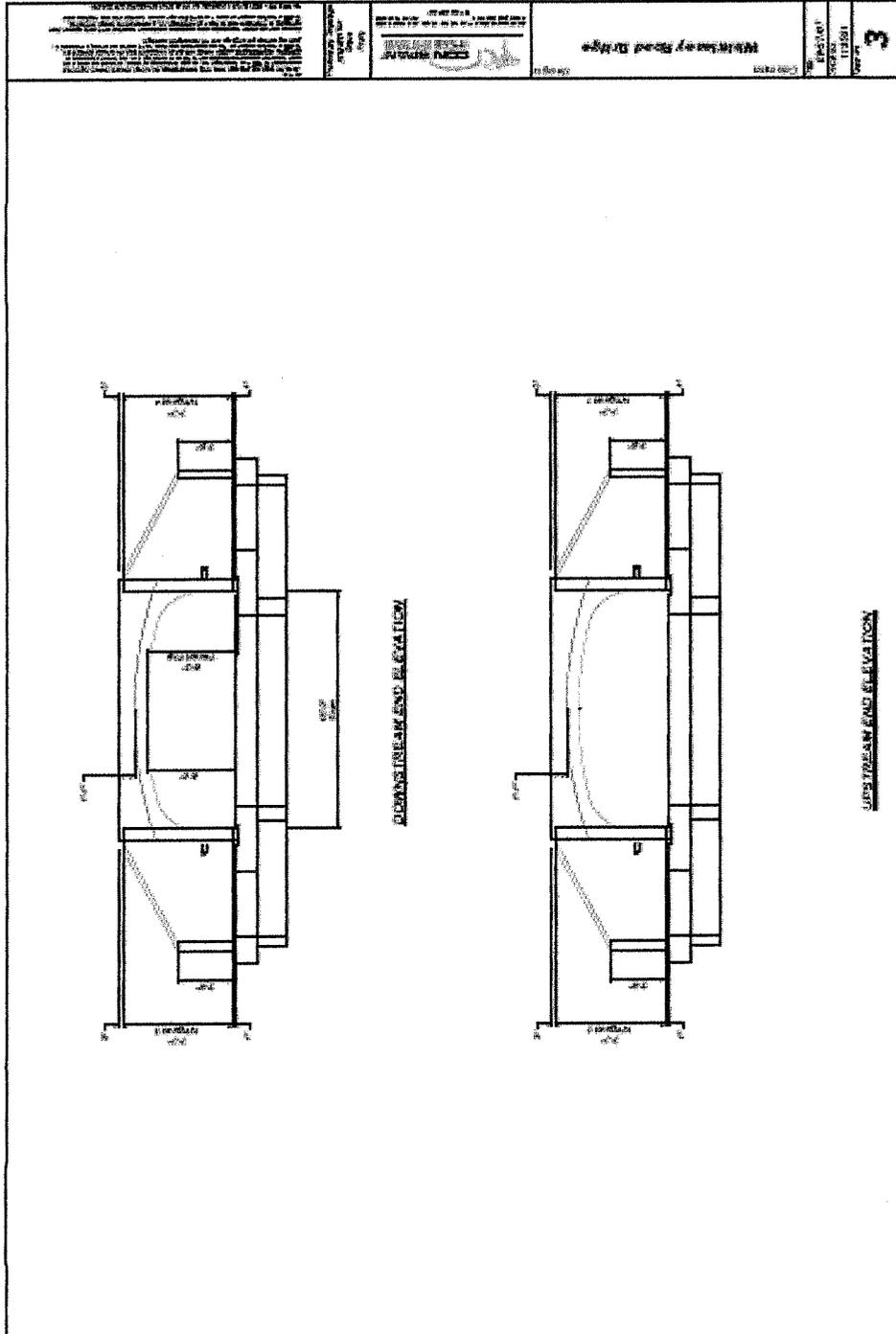


PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
 Muscogee County, Georgia Department of Transportation, District 3  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED       ALTERNATIVE

SHEET NO.: 4 of 10





PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
**Muscogee County, Georgia Department of Transportation, District 3**  
*Design Development Stage*

ALTERNATIVE NO.:

18

AS DESIGNED       ALTERNATIVE

SHEET NO.: 5 of 10

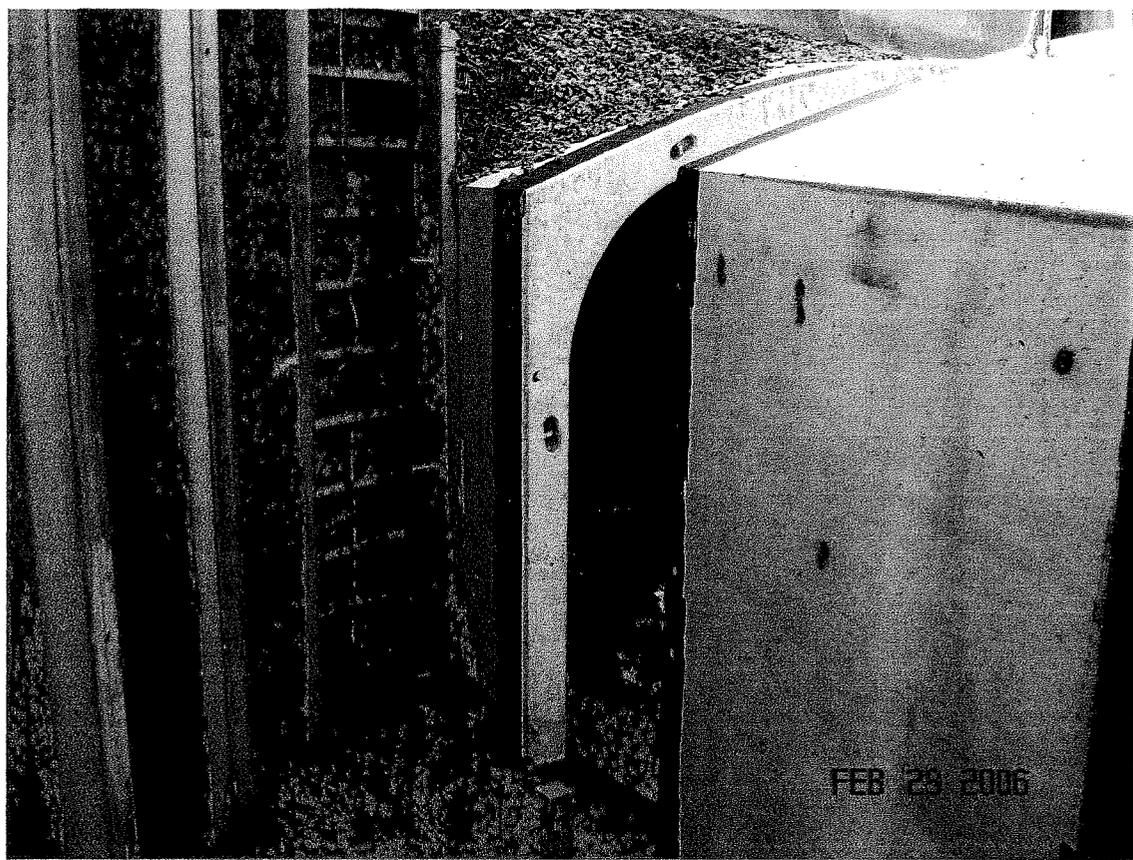


PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
Muscogee County, Georgia Department of Transportation, District 3  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED       ALTERNATIVE

SHEET NO.: 6 of 10

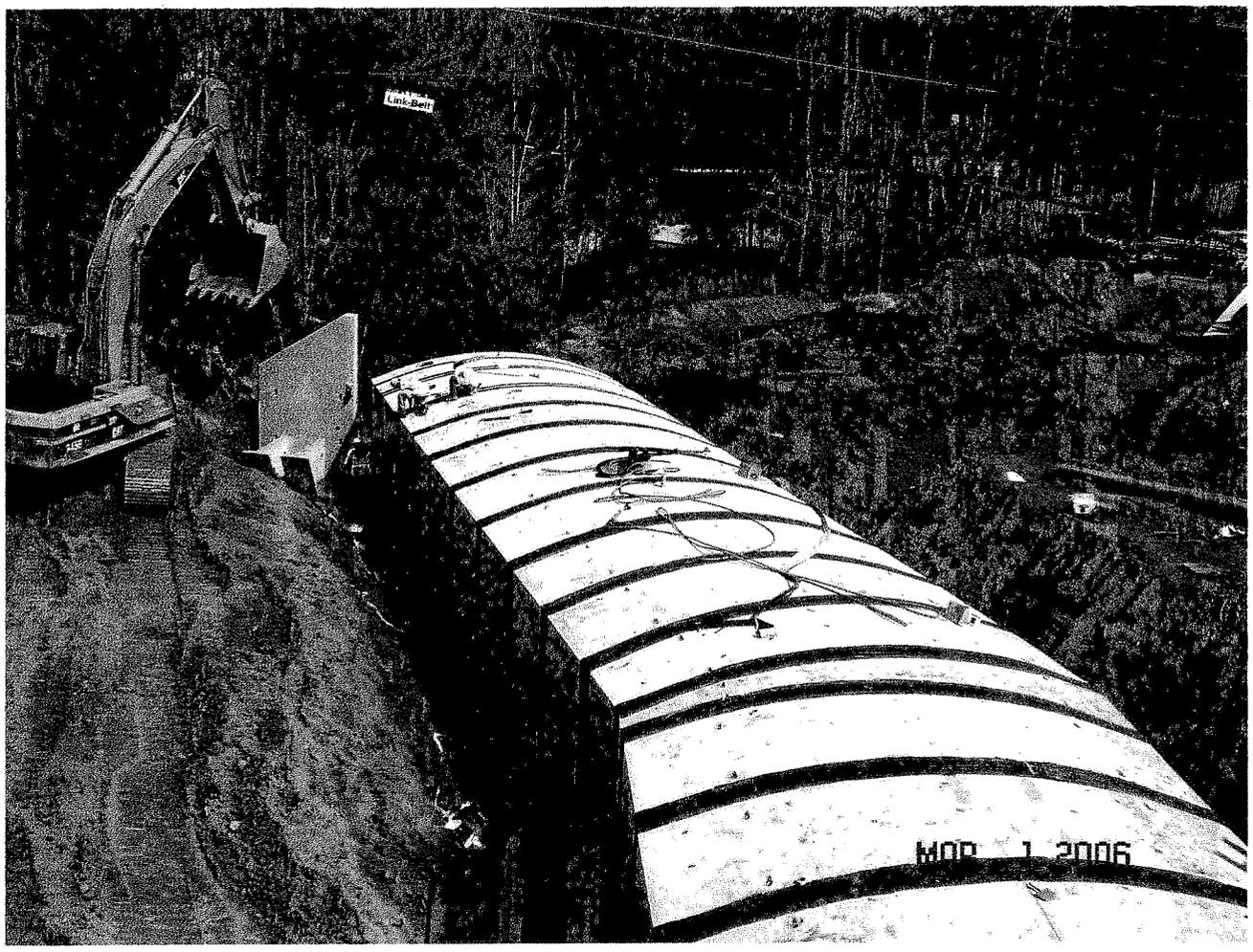


PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
Muscogee County, Georgia Department of Transportation, District 3  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED     ALTERNATIVE

SHEET NO.: 7 of 10



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749,**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
Muscogee County, Georgia Department of Transportation, District 3  
*Design Development Stage*

ALTERNATIVE NO.:  
**18**

AS DESIGNED       ALTERNATIVE

SHEET NO.: 8 of 10





PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscooke County, GDOT*

ALTERNATIVE NO.: 18

DESCRIPTION: **USE A PRECAST ARCH STRUCTURE IN LIEU OF BOX  
CULVERT**

SHEET NO 9 of 10

From: Poole, Steve (PooleS@contechbridge.com)  
To: Bradley, Tony  
Sent: Thursday September 27, 2007 5:35 PM  
Subject: Whittlesey Road Bridge - VE Columbus, GA

#### Site Information and Assumptions

- Existing design = Dual 7' span x 6' rise x 125' long CIP box culvert with approx. 5' of fill over top (84 sf waterway opening)
- No known environmental concerns that would require a bottomless structure
- Well traveled road, speed of construction is beneficial

#### Alternative Structure

CON/SPAN 16' span x 6' rise x 125' long precast clear span on a base slab (87 sf waterway opening)

#### Budget Estimate

- \$114,000 - Materials delivered, exclusive of taxes (includes precast arches, headwalls, and wing walls).
- \$ 50,050 - Cast-in-place concrete base slab (estimated at 15" thick x 20' wide x 128' long = 130 CY at \$385/CY in-place = \$50,050)
- \$ 30,000 - Installation: Crane and crew for two days
- Excavation and backfill of structure not included
- There will be a critical backfill zone (4' outside the legs and up to 2' over the top of structure) that will require A1, A2, A3, or A4 backfill material. Outside this zone, regular roadway embankment can be used.
- Foundation and installation costs are by others. Adjust numbers as you see fit. I have seen CIP flatwork (base slab, strip footings) going for around \$385 in-place (steel and concrete). The installation costs for crane and crew should be plenty to cover actual cost of crane and crew, but it may not cover a typical contractor "mark-up" for these items.

This system is conducive for stage construction if an on-site detour is needed to keep traffic flowing during construction. If the existing alignment and available right-of-way will allow it, a portion of the structure can be built while keeping the current lanes open to traffic. The stage I portion of the structure can be backfilled for temporary traffic, the remaining portion can then be constructed and backfilled, and then traffic can be shifted back. This is very similar to a CON/SPAN that is being installed in a phased construction sequence on Rockbridge Road in Gwinnett County. This is a similar situation...highly traveled road, keeping road open with an on-site traffic diversion during construction. The first phase of the precast is scheduled to be set Oct 10th. I have attached photos of another similar project that installed two years ago in Cherokee County. The photos show Phase I already set and shored (and traffic shifted) and the contractor is starting Phase II of the project.

Once the cast-in-place base slab or strip footings are completed (and reach 50% of their design strength), the precast components can be set. The setting of the precast for the entire structure would only take about two days for this 125' long structure (or one day each for two phases). The keyway is then grouted, and then the structure is ready for backfill. The system installs very quickly.

I hope this is helpful. Please call me if you have any questions.

Steven T. Poole, P.E.  
Region Manager  
CONTECH Bridge Solutions Inc.  
6075 Atlantic Boulevard, Suite A-1  
Norcross, GA 30071  
Phone: 678-662-9331  
Fax: 770-409-0133  
PooleS@contechbridge.com



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **20**

DESCRIPTION: **INCORPORATE PARCEL NO. 12 IN THE GREEN SPACE**

SHEET NO.: **1 of 2**

**ORIGINAL DESIGN:**

The current design calls for Parcel No. 12 to remain as a residential property. However, the surrounding adjacent five residential parcels are being taken in order for the City of Columbus to create a “green space” along Whittlesey Road across from the historic property, Parcel No. 8.

**ALTERNATIVE:**

Purchase Parcel No. 12 in its entirety and include as part of the planned green space.

**ADVANTAGES:**

- Reduces construction impacts
- Could improve project schedule
- Increases the green space
- Improves sustainability parameters

**DISADVANTAGES:**

- Increases initial right-of-way costs

**DISCUSSION:**

Purchasing this parcel will provide the City of Columbus with the opportunity to create a longer, continuous green space with the abutting properties that, coincidentally, are across the street from one of the two the historic properties in the project’s area. This alternative creates a much larger buffer zone that is adjacent to the only residential area on this side of the project.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 0	—	\$ 0
ALTERNATIVE	\$ 183,023	—	\$ 183,023
SAVINGS	\$ (183,023)	—	\$ (183,023)



# VALUE ENGINEERING ALTERNATIVE



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
WHITTLESEY ROAD**  
*Muscogee County, GDOT*

ALTERNATIVE NO.: **22**

DESCRIPTION: **RAISE THE PROFILE OF THE FACILITY FROM THE  
RAILROAD CROSSING TO VETERANS PARKWAY**

SHEET NO.: **1 of 7**

**ORIGINAL DESIGN:** (Sketch Attached)

The current design indicates a cut for full depth pavement construction from the at-grade railroad crossing to Veterans Parkway, Station (STA) 52+09 to STA 61+89. It is noted that beginning near STA 52+70 to approximately STA 60+75, the pavement will have to be removed.

**ALTERNATIVE:** (Sketch Attached)

Raise the profile of the facility in the aforementioned section to incorporate the existing pavement in the design/construction of the new roadway. This will allow widening on the north and south sides of the existing road and reduces excavation.

**ADVANTAGES:**

- Reduces initial construction costs
- Uses an existing asset – the current roadway
- Use existing pavement for construction staging
- Could improve project schedule

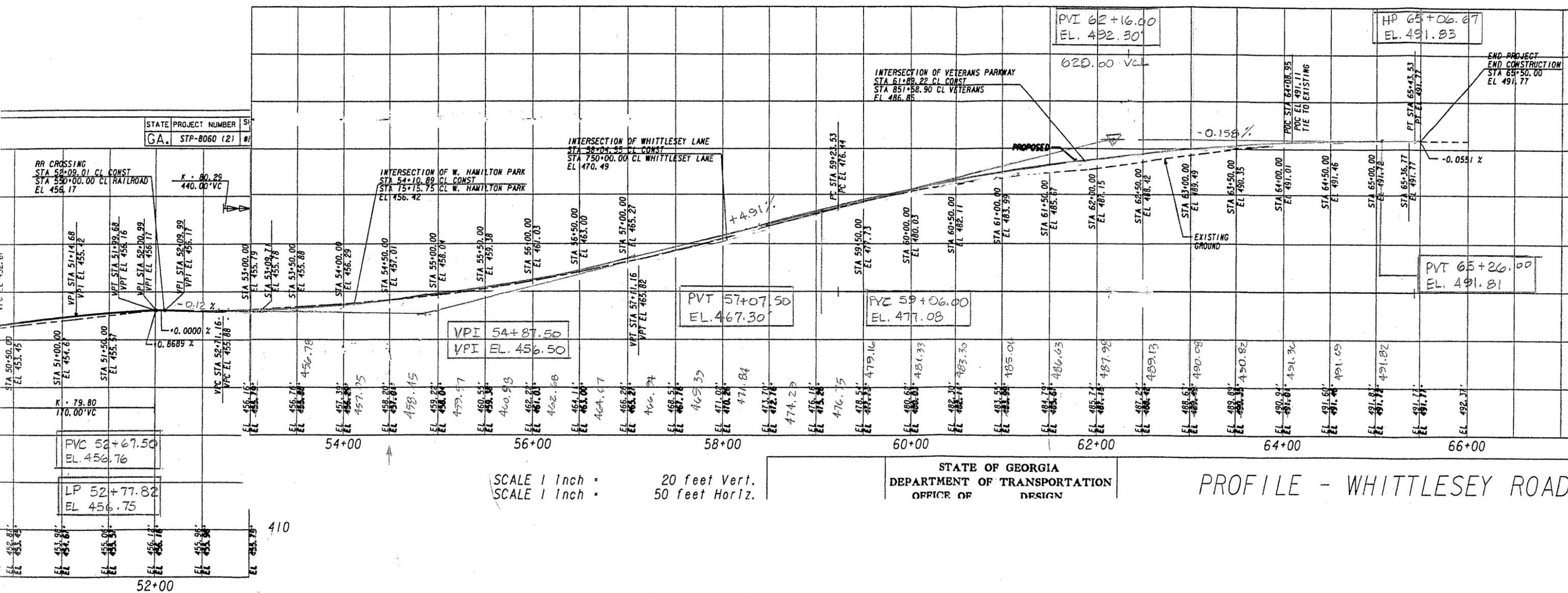
**DISADVANTAGES:**

- None apparent

**DISCUSSION:**

This alternative will facilitate maintenance of traffic and improve traffic flows during construction. This alternative will not affect the railroad grade.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,965,275	—	\$ 1,965,275
ALTERNATIVE	\$ 1,797,522	—	\$ 1,797,522
SAVINGS	\$ 167,753	—	\$ 167,753

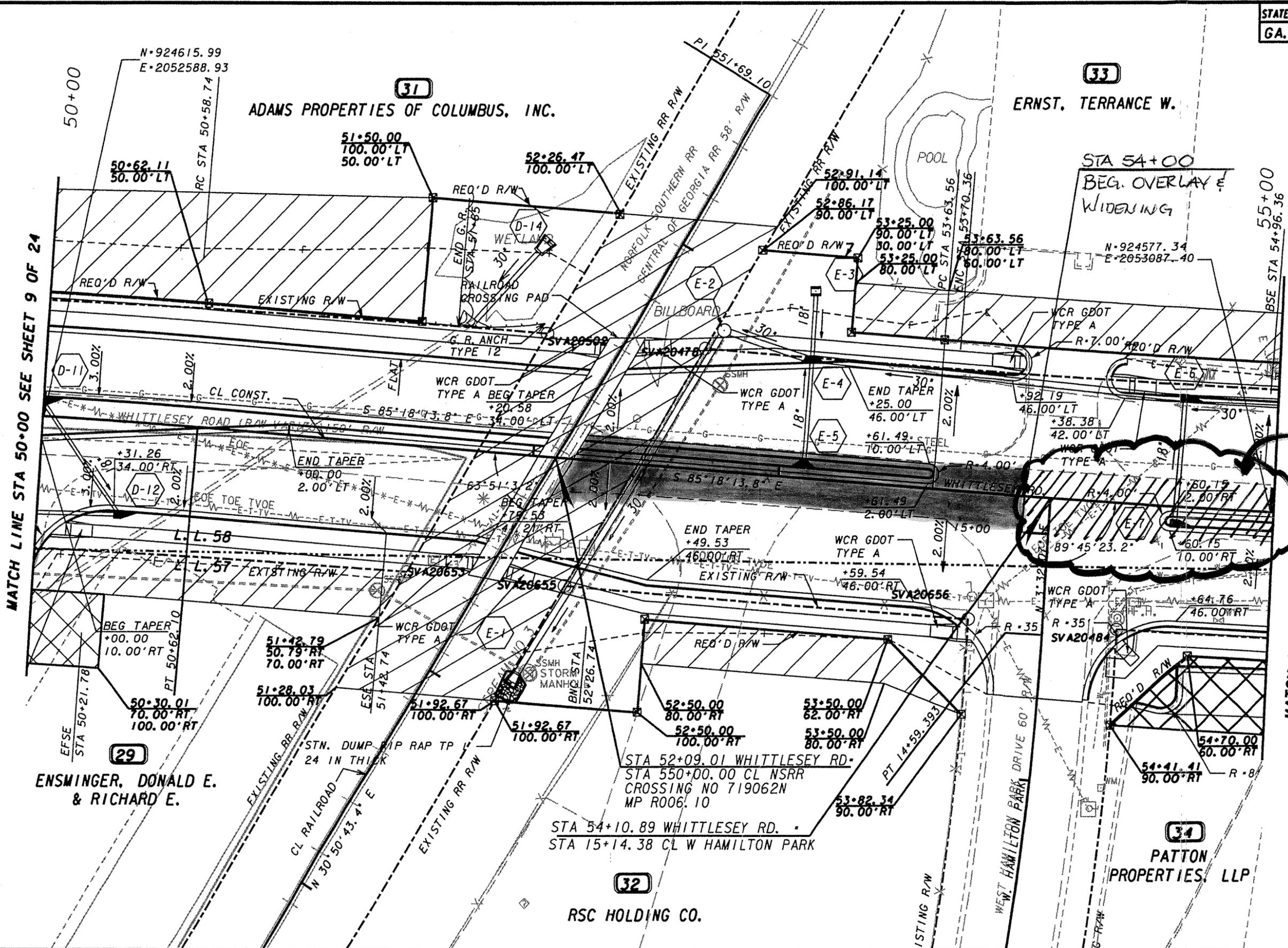


SCALE 1 Inch = 20 feet Vert.  
SCALE 1 Inch = 50 feet Horiz.

STATE OF GEORGIA  
DEPARTMENT OF TRANSPORTATION  
OFFICE OF DESIGN

PROFILE - WHITTLESEY ROAD

3 of 7



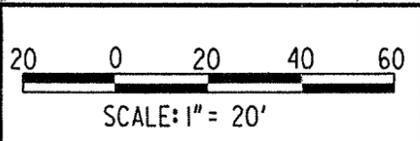
MATCH LINE STA 50+00 SEE SHEET 9 OF 24

MATCH LINE STA 55+00 SEE SHEET 10 OF 24

A

PROPERTY AND EXISTING R/W LINE	---
PIERRED R/W LINE	---
CONSTRUCTION LIMITS	---
PERMIT FOR CONSTRUCTION	---
MAINTENANCE OF SLOPES	---
PERMIT FOR CONSTRUCTION OF SLOPES	---
PERMIT FOR CONSTRUCTION OF DRIVES	---

BEGIN LIMIT OF ACCESS	.....	BLA
END LIMIT OF ACCESS	.....	ELA
LIMIT OF ACCESS	---	
REQUIRED R/W AND LIMIT OF ACCESS	---	



DATE	REVISIONS	DATE	REVISIONS

**KCS**  
KISINGER CAMPO & ASSOCIATES CORP.  
1720 PEACHTREE ST., N.W., SUITE 1048  
ATLANTA, GA 30309

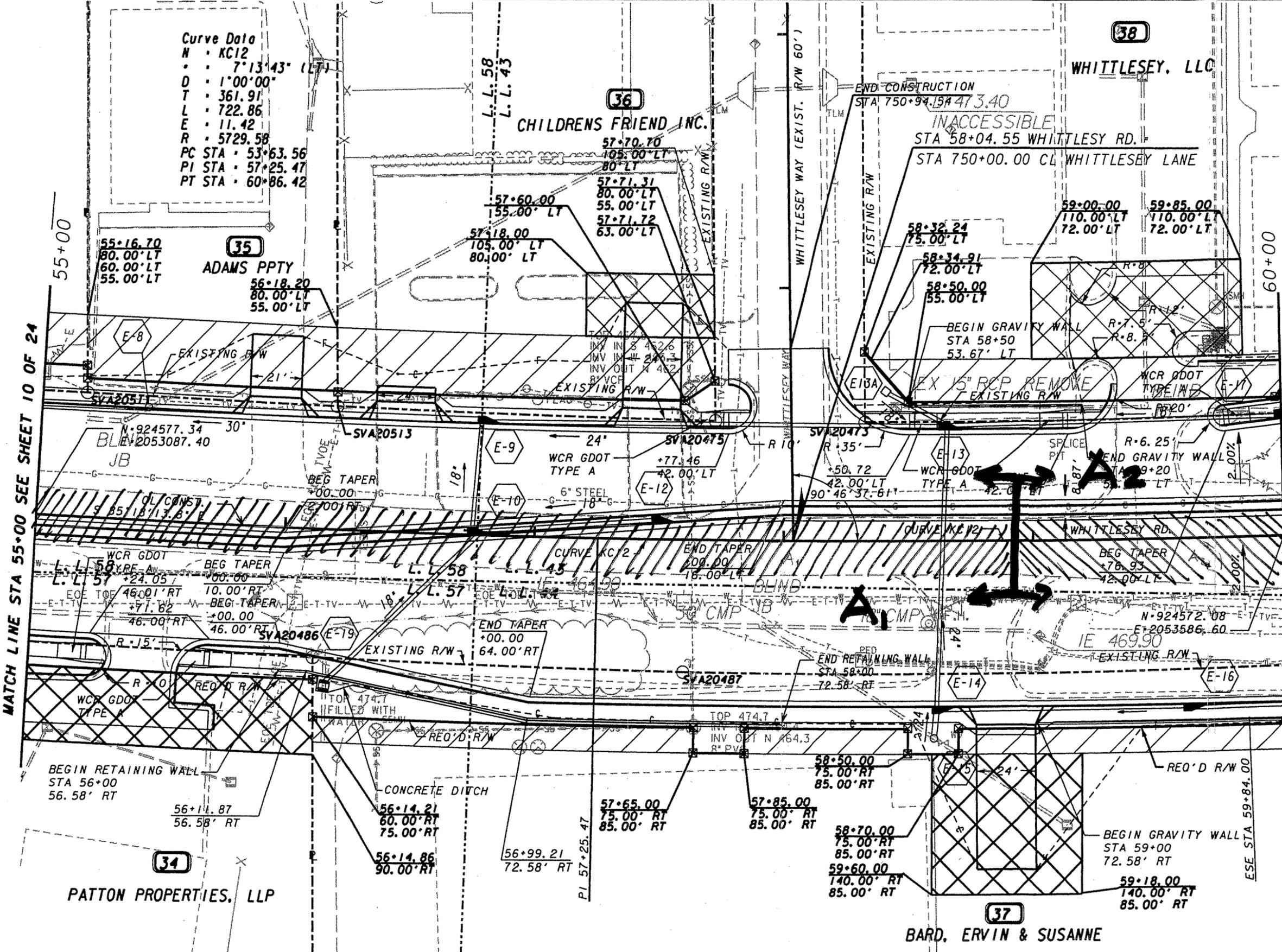
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	STP-8060 (2)	41	41



MATCH LINE STA 55+00 SEE SHEET 10 OF 24

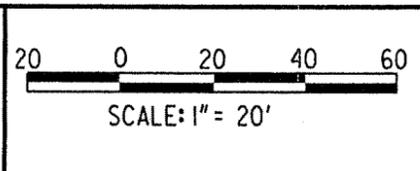
MATCH LINE STA 60+00 SEE SHEET 12 OF 24



Curve Data  
 N • KC12  
 • • 7°13'43" (LT)  
 D • 1'00'00"  
 T • 361.91'  
 L • 722.86'  
 E • 11.42'  
 R • 5729.58'  
 PC STA • 53+63.56  
 PI STA • 57+25.47  
 PT STA • 60+86.42

PROPERTY AND EXISTING R/W LINE	---	BEGIN LIMIT OF ACCESS.....	BLA
REQUIRED R/W LINE	---	END LIMIT OF ACCESS.....	ELA
CONSTRUCTION LIMITS	---	LIMIT OF ACCESS	---
ELEMENT FOR CONSTRUCTION	---	REQUIRED R/W AND LIMIT OF ACCESS	---
MAINTENANCE OF SLOPES	---		
ELEMENT FOR CONSTRUCTION OF SLOPES	---		
ELEMENT FOR CONSTRUCTION OF DRIVES	---		

DATE	REVISIONS	DATE	REVISIONS



DATE	REVISIONS	DATE	REVISIONS

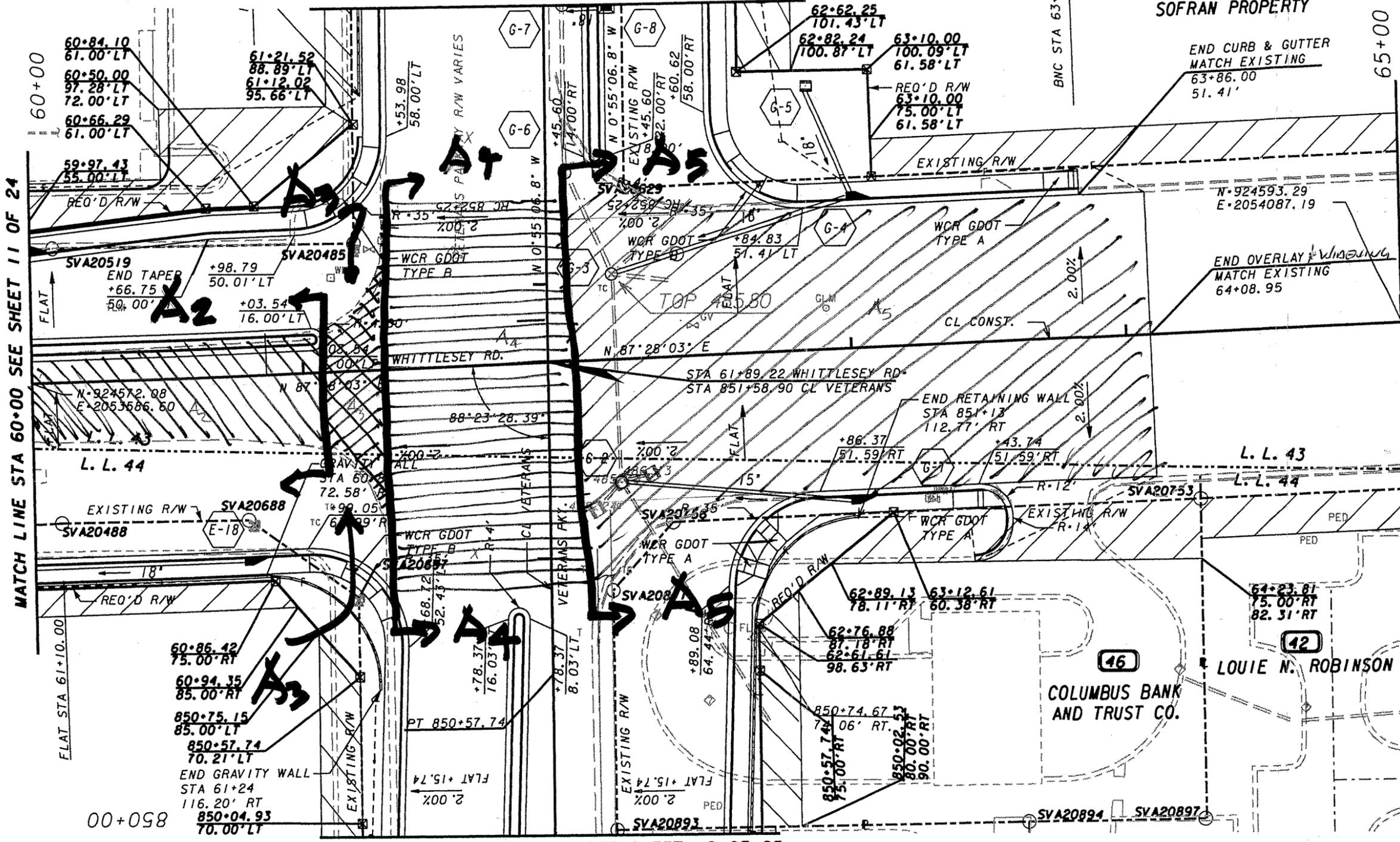
**KISINGER CAMPO & ASSOCIATES CORP.**  
 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	STP-8060 (2)	41	41

547

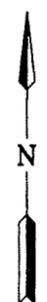
MATCH LINE STA 853+00 SEE SHEET 20 OF 24



MATCH LINE STA 60+00 SEE SHEET 11 OF 24

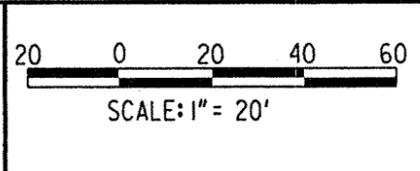
MATCH LINE STA 65+00 SEE SHEET 13 OF 24

MATCH LINE STA 850+00 SEE SHEET 19 OF 25



PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
ELEMENT FOR CONSTR	---
MAINTENANCE OF SLOPES	---
ELEMENT FOR CONSTR OF SLOPES	---
ELEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....	BLA
END LIMIT OF ACCESS.....	ELA
LIMIT OF ACCESS	---
REQUIRED R/W AND LIMIT OF ACCESS	---



DATE	REVISIONS	DATE	REVISIONS



**KISINGER CAMPO & ASSOCIATES CORP.**  
1720 PEACHTREE ST., N.W., SUITE 1046  
ATLANTA, GA 30309

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
**CONSTRUCTION PLAN**  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
 Muscogee County, Georgia Department of Transportation, District 3  
 Design Development Stage

ALTERNATIVE NO.:

22

SHEET NO.: 6 of 7

## WHITTLESEY ROAD QTY. REDUCTION AREAS Comp'd

STA. 54+00 - STA. 64+08.95 AREA OF FOCUS

22' WIDE EXIST. ROADWAY

• STA. 54+00 - STA. 59+06 = 506.00'

$$A_1 = 22' \times 506' = \underline{11,132.00 \text{ FT.}^2}$$

• STA. 59+06 - STA. 61+08

$$A_2 = \frac{L_1 + L_2}{2} (S) = \frac{22' + 40'}{2} (202')$$

$$= \underline{6262.00 \text{ FT.}^2}$$

• STA. 61+08 - STA. 61+31.00

$$A_3 = \frac{L_1 + L_2}{2} (S) = \frac{40' + 102'}{2} (23')$$

$$= \underline{1633 \text{ FT.}^2}$$

• STA. 61+31 - STA. 62+00

$$A_4 = \frac{L_1 + L_2}{2} (S) = \frac{140' + 143'}{2} (69')$$

$$= \underline{9,763.50 \text{ FT.}^2}$$

• STA. 62+00 - STA. 64+08.95

$$A_5 = L \times W = 208.95' \times 120'$$

$$= \underline{25,074 \text{ FT.}^2}$$

$$\text{TOTAL} = A_1 + A_2 + A_3 + A_4 + A_5$$

$$= \underline{53,864.50 \text{ FT.}^2}$$

## CONSTRUCTION GRADING REDUCTIONS

$$A_1 + A_2 + A_3 = T$$

$$11,132.00 + 6262.00 + 1633 = T$$

$$\underline{19,027 \text{ FT.}^2} = T$$

CLEARING & GRUBBING \$ 320,000

PERMANENT GRASSING 22 ACS (43,500)

$$= 958,320$$

CLEARING & GRUBBING / SF = 0.33¢

CLEARING AND GRUBBING REDUCTION COST

GRADE REDUCTION 19,027 FT.<sup>2</sup> (.33¢)

$$= 6353.45$$

G.A.B REDUCTION - STA. 54+00 - STA.

110 #/FT.<sup>3</sup>  
SP. WT.

$$\text{TOTAL TMS} = 53,864.50 \times 1' (\text{DEPTH OF G.A.B})$$

$$= \underline{53,864.50 \text{ FT.}^3} \times 110 \text{ \#/FT.}^3 \div 2000$$

$$= \underline{2962.54 \text{ TMS}} \times 0.10 = 296.25$$

$$\text{TMS} = 2962.54 + 296.25$$

$$= 3258.80 \text{ TMS} = \underline{3259 \text{ TMS}}$$



# VALUE ENGINEERING ALTERNATIVE



**PROJECT:** STP-8060(2), P. I. No. 351010 AND STP-0005-00(749),  
 P.I. No. 0005749 WIDENING AND RECONSTRUCTION OF  
 WHITTLESEY ROAD  
 Muscogee County, GDOT

ALTERNATIVE NO.: 23

**DESCRIPTION:** USE 10-FOOT SHOULDERS THROUGHOUT THE PROJECT  
 WHERE POSSIBLE

SHEET NO.: 1 of 6

**ORIGINAL DESIGN:** (Sketch attached)

The current design calls for the use of 16-foot shoulders for the majority of the project. The design shifts the mainline of the facility along Whittlesey Road south between STA 26+60 and STA 39+98.17 to avoid conflicts with the historic property, Parcel No. 8.

**ALTERNATIVE:** (Sketch attached)

Reduce the shoulder width from 16 feet to 10 feet throughout the project where possible. Not only is right-of-way reduced, but between STA 26+60 and STA 39+98.17, it will aid in placing the alignment in a more tangent section than the as-designed curve.

**ADVANTAGES:**

- Reduces construction impacts
- Improves alignment for safety
- Reduces right-of-way costs
- Could improve project schedule

**DISADVANTAGES:**

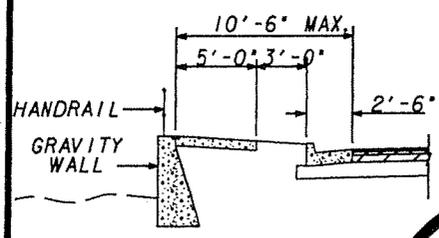
- Reduces the typical section

**DISCUSSION:**

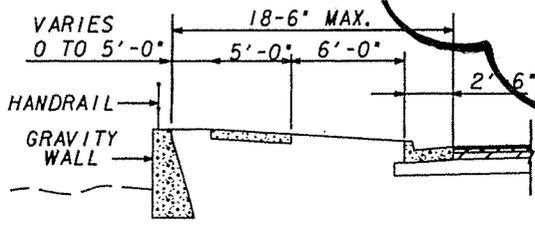
The reduction in the typical section will help reduce the overall required right-of-way and construction easements along with the reduction of borrow material.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 5,340,465	—	\$ 5,340,465
ALTERNATIVE	\$ 183,023	—	\$ 183,023
SAVINGS	\$ 5,157,442	—	\$ 5,157,442

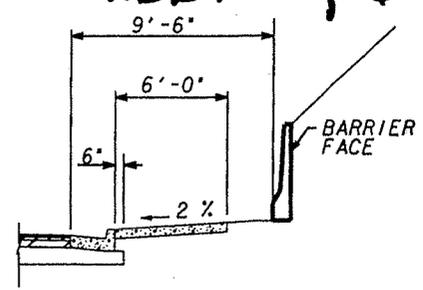
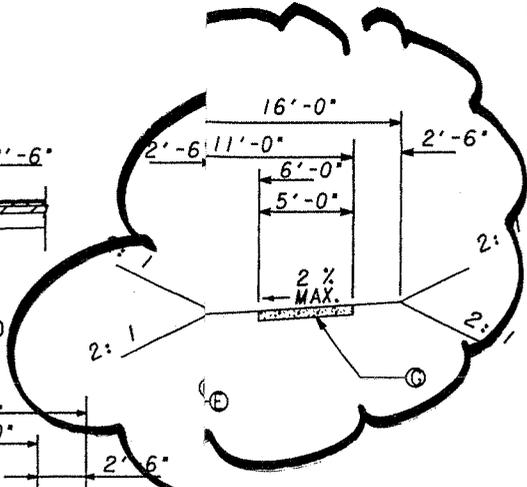
23  
SHEET 2 of 6



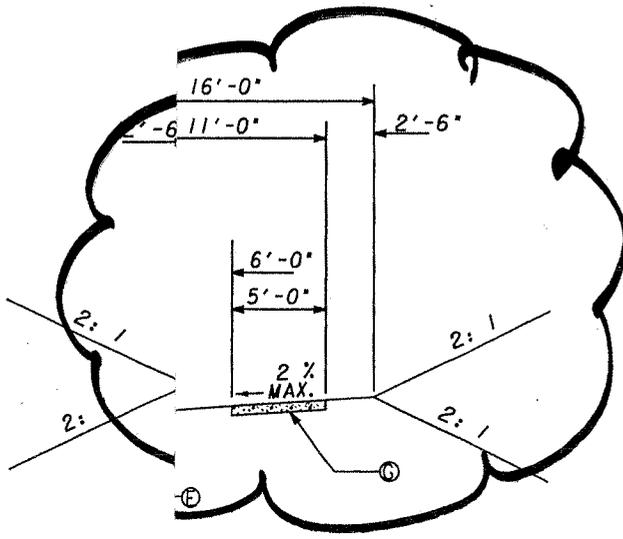
FROM 13+35.52 TO 16+12.60



FROM 19+68.33 TO 21+42.71



FROM 43+00.00 TO 47+00.00  
LEFT AND RIGHT UNDER  
BRIDGE



AS DES

PRELIMINARY  
NOT FOR CONSTRUCTION

- REQUIRED PAVEMENT
- ASPHALTIC CONCRETE 12.5 MM SUPERPAVE, 165 LBS/SY, LEVEL C
  - ASPHALTIC CONCRETE 19 MM SUPERPAVE, 220 LBS/SY, LEVEL C
  - ASPHALTIC CONCRETE 25 MM SUPERPAVE, 660 LBS/SY, LEVEL B
  - GRADED AGGREGATE BASE, 12 IN
  - CONCRETE CURB & GUTTER, 8 IN X 30 IN, TYPE 2, GDOT STD. 9032B
  - CONCRETE CURB & GUTTER, 8 IN X 30 IN, TYPE 7, GDOT STD. 9032B
  - CONCRETE SIDEWALK, 4 IN

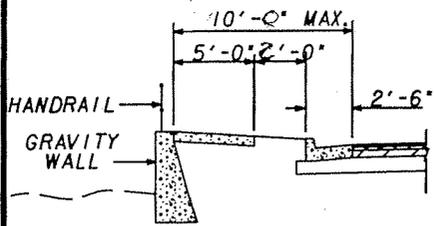
SHEET \$ DATES



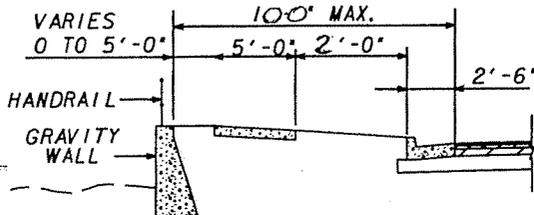
KISINGER CAMPO &  
ASSOCIATES CORP.  
1720 PEACHTREE ST., N.W., SUITE 1048  
ATLANTA, GA 30309

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT STP-8060 (2)  
COUNTY MUSCOGEE  
DATE SH 1 OF

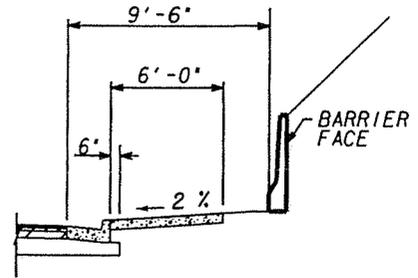
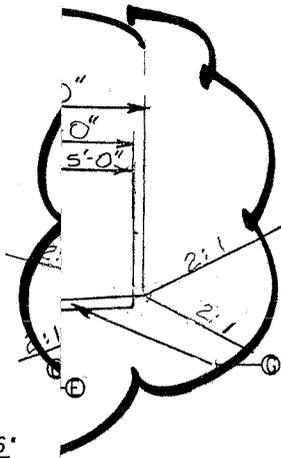
23  
**SHEET 3 OF 6**



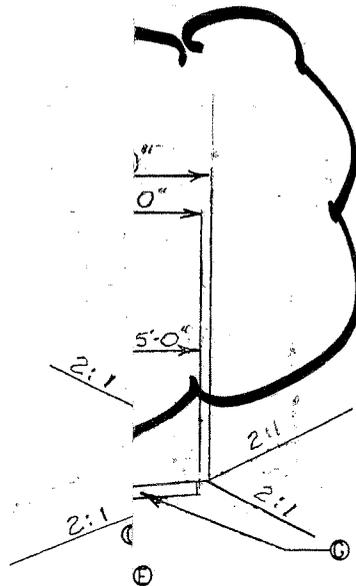
FROM 13+35.52 TO 16+12.60



FROM 19+68.33 TO 21+42.71



FROM 43+00.00 TO 47+00.00  
 LEFT AND RIGHT UNDER  
 BRIDGE



**ALTERNAT**

REQUIRED PAVEMENT

- ASPHALTIC CONCRETE 12.5 MM SUPERPAVE, 165 LBS/SY, LEVEL C
- ASPHALTIC CONCRETE 19 MM SUPERPAVE, 220 LBS/SY, LEVEL C
- ASPHALTIC CONCRETE 25 MM SUPERPAVE, 660 LBS/SY, LEVEL B
- GRADED AGGREGATE BASE, 12 IN
- CONCRETE CURB & GUTTER, 8 IN X 30 IN, TYPE 2, GDOT STD. 9032B
- CONCRETE CURB & GUTTER, 8 IN X 30 IN, TYPE 7, GDOT STD. 9032B
- CONCRETE SIDEWALK, 4 IN

PRELIMINARY  
 NOT FOR CONSTRUCTION



KISINGER CAMPO &  
 ASSOCIATES CORP.  
 1720 PEACHTREE ST., N.W., SUITE 1048  
 ATLANTA, GA 30309

GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
 TYPICAL SECTIONS  
 PROJECT STP-8060 (2)  
 COUNTY MUSCOGEE  
 DATE SH 1 OF 84

# CALCULATIONS



PROJECT: **STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
**Muscogee County, Georgia Department of Transportation, District 3**  
**Design Development Stage**

ALTERNATIVE NO.:

23

SHEET NO.: 4 of 6

SHOULDER REDUCTION AREAS - WHITTLESEY ROAD

STA. 8+03.41 - STA. 24+50.00 LT. & RT.

STA. 26+17.40 - STA. 39+50.00 LT. & RT.

STA. 40+45.00 - STA. 54+60.00 LT. & RT.

TOTAL LENGTH FOR REDUCTION

4,434.19 LF

• SHOULDER REDUCTION AREAS - WHITESVILLE ROAD

STA. 243+70 - STA. 248+70.00 LT. & RT.

STA. 250+30 - STA. 254+20.00 LT. & RT.

TOTAL LENGTH FOR REDUCTION

890.00 LF

• SHOULDER REDUCTION AREAS - BRADLEY PARK (REDUCTION TO OCCUR ON RIGHT SIDE)

STA. 13+67.00 - STA. 18+50 RT. ONLY

TOTAL LENGTH 483.00 LF

• SHOULDER REDUCTION AREAS - VETERANS PARKWAY

STA. 839+15.00 - STA. 839+94.72 RT. & LT.

STA. 839+94.72 - STA. 850+57.74 LT. ONLY

STA. 850+57.74 - STA. 856+06.67 RT. & LT.

STA. 856+22.00 - STA. 868+00.00 LT. ONLY

STA. 863+24.00 - STA. 868+00.00 RI. ONLY

TOTAL LENGTH = 3,974.32 LF

WHITTLESEY ROAD

$$4,434.19 \text{ LF} \times 12' \div 9 = \underline{5,912.25 \text{ SY}}$$

BRADLEY PARK ROAD

$$483.00 \text{ LF} \times 6' \div 9 = \underline{322.00 \text{ SY}}$$

WHITESVILLE ROAD

$$890.00 \text{ LF} (12') = 10,680 \text{ SF} \div 9 = \underline{1,186.67 \text{ SY}}$$

VETERANS PARKWAY

$$3,974.32 \text{ LF} \times 6' \div 9 = \underline{2,649.54 \text{ SY}}$$

# CALCULATIONS



PROJECT: STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
 Muscogee County, Georgia Department of Transportation, District 3  
 Design Development Stage

ALTERNATIVE NO.:

23

SHEET NO.: 5 of 6

REDUCTION OF SHOULDERS THROUGHOUT PROJECT +

RIGHT OF WAY REDUCTION COST

WHITTLESEY ROAD

$$4,434.19' \times 12' = 53,210.28 \text{ FT}^2 \text{ REDUCTION OF RIGHT-OF-WAY}$$

COMMERCIAL AND RESIDENTIAL RIGHT-OF-WAY REDUCTION FOR CONSTRUCTION

$$53,210.28 \text{ SF} \times \$16.00 \text{ SF} = 851,364 (.75) = \underline{\underline{\$638,523.30}}$$

\* REDUCED BY  $\frac{3}{4}$  QUARTERS PERCENT FOR RESIDENTIAL

ALL ROADS AFFECTED BY DESIGN:

EARTH WORK: ASSUMED DEPTH ON AVG. 8'

$$\text{LENGTH } 10,042.86' \times 12' \times 8' / 27 = \underline{\underline{35,707.95 \text{ CY}}} \text{ REDUCTION}$$

GRAVING COMPLETE REDUCTION

$$\underline{\underline{35,707.95 \text{ CY}}}$$

WHITESVILLE ROAD

$$890.00' \times 12' = 10,680.00 \text{ SF} \times \$16.00 = \underline{\underline{\$170,880.00}} \text{ COMMERCIAL}$$

BRADLEY PARK

$$483.00' \times 6' = 2,898.00 \text{ SF} \times \$16.00 = \underline{\underline{\$46,368.00}} \text{ COMMERCIAL}$$

VETERANS PARKWAY

$$3,974.32' \times 6' = 23,845.92 \text{ SF} \times \$16.00 \\ = \underline{\underline{\$381,534.72}}$$

# COST WORKSHEET



PROJECT: **STP-8060(2), P.I. No. 351010 & STP-0005-00(749), P.I. NO. 0005749** ALTERNATIVE NO: 23  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
*Muscogee County, GDOT*

SHEET NO.: 6 of 6

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/UNIT	TOTAL	NO. OF UNITS	COST/UNIT	TOTAL
Right-of-Way Reduction							
Whittlesey Road							
4,434' x 12' = 53,208 SF (Unit cost is 75% of \$16.00 the full commercial value to account for a residential value.)	sf	53,208	12.00	638,496			
Whitesville Road							
890' x 12' = 10,680 SF	sf	10,680	16.00	170,880			
Bradley Park Drive							
483' x 6' = 2,898 SF	sf	2,898	16.00	46,368			
Veterans Parkway							
3,974' x 6' = 7,728 SF	sf	23,844	16.00	381,504			
Temp. Easement for Parcel No. 12							
A <sub>1</sub> = (85+72) / 2 x 16 = 1,256 SF and A <sub>2</sub> = ½ x 24 x 85 = 1,020 SF. Therefore Σ = 2,276	sf	2,276	0.75	1,707			
Parcel No. 12 - Damage Proximity	ea				1	17,000	17,000
Parcel No. 12 - Cost to Cure	ea				1	35,714	35,714
ROW Subtotal				1,238,955			52,714
ROW Markup at 247.20%				3,062,697			130,309
ROW Total				4,301,652			183,023
Earthwork Quantities							
((10,043 LF + 2851 LF) x 12' x 8') / (27' / CY) = 45,845 CY [Both Contracts]	cy	45,854	18.00	825,372			
Construction Subtotal				825,372			
Constr. Markup at 25.86%				213,441			
Construction Total				1,038,813			
<b>Sub-total</b>				5,340,465			183,023
<b>Mark-up at</b>				Included			Included
<b>TOTAL</b>				5,340,465			183,023

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## PROJECT DESCRIPTION

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### NEED AND PURPOSE

The purpose of the proposed Whittlesey Road widening project in Columbus, Muscogee County, Georgia is to improve safety for both pedestrians and drivers, improve access, and increase capacity along this facility. Whittlesey Road is an urban collector street and provides access to I-185, which is part of the Governor's Road Improvement Program (GRIP) and the National Highway System (NHS). Whittlesey Road begins at Bradley Park Drive, just east of United State Route 80 (US 80), and terminates at US 27/State Route 1 (SR 1)/Veterans Parkway/Martha Berry Highway; from here out called Veterans Parkway. Just east of Veterans Parkway, the name of Whittlesey Road changes to Weems Road. The major land use along Whittlesey Road is commercial, which includes Patton Plaza Shopping Center, auto dealerships, restaurants, office buildings, Lowes and the Main Street Shopping Center, located near Veterans Parkway. There is one area zoned residential, south of Whittlesey Road between Whitesville Road and Bradley Park Drive. The recent growth of commercial development along the corridor and its proximity to major arterials and Interstates are contributing factors to the need for improvements along Whittlesey Road.

Of regional importance, Whittlesey Road is part of a system of urban collector streets that feed into the Interstate and Georgia State Route system in the northern part of Columbus. Approximately 0.15 miles north of the Whittlesey Road and Veterans Parkway intersection, Veterans Parkway has direct access to the US 80/North Bypass. A second access route to US 80/North Bypass is at the Bradley Park Drive interchange approximately 0.25 miles to the west of the project corridor. The Whittlesey Road corridor is located directly in between these two access points to the US 80/North Bypass which is an east-west route connecting to I-185 and Veterans Parkway in Georgia and to US 280/US 431 in Alabama. I-185 and US 280/SR 520 are part of the GRIP, NHS, and Surface Transportation Assistance Act National Network Route. Whittlesey Road is located approximately 1.70 mile northwest of the Columbus Metropolitan Airport.

Whittlesey Road currently has high accident rates, limited capacity, and increased traffic volumes. The Veterans Parkway corridor, an urban principal arterial in the project vicinity, is a primary north-south corridor in western Georgia. The existing Whittlesey Road corridor possesses several safety and operational deficiencies that this project would address. These deficiencies include:

- Substandard capacity for existing and predicted traffic volumes;
- No turn lanes on Whittlesey Road and adjoining side streets to provide refuge for turning motorists;
- No sidewalks;
- Substandard vertical geometry at the Whitesville Road/Whittlesey Road intersection; and
- Numerous side streets, driveways, and shopping center intersections that cause frequent stops in traffic flow.

According to the socio-economic analysis performed for this project, the composition of the region is approximately 4% low-income and 17% minority, which are both below the average percentages for Muscogee County and the State of Georgia. According to the year 2000 United States Census data, the study area's age distribution is approximately 11% elderly people (65 years and older) and 23%

minors (17 years old and younger). The percentage of elderly people is similar to the county and state averages; however, the percentage of minors (17 years and younger) is slightly lower than the county and state averages. The proposed project would be beneficial to all age, race, and income groups by increasing pedestrian safety with new sidewalks and improving access to the commercial shopping areas, as well as connecting pedestrians to Columbus' public transit system, Columbus Metropolitan Transit System (METRA). The proposed median would limit the turns of vehicles into driveways, further creating a safer pedestrian environment along Whittlesey Road.

The community is accessible via the Columbus' METRA that runs on Whittlesey Road from Bradley Park Drive (near the US 80 access point) to Veterans Parkway and progresses southbound on Veterans Parkway. This bus route connects the commercial development on Whittlesey Road, just west of Whitesville Road, with the commercial development at the northeast corner of Whittlesey Road and Veterans Parkway. The sidewalks would provide pedestrian connectivity and provide alternate mode of travel within the area. The proposed project conforms to the existing and fixture Land Use Plan for the County, where commercial and residential development will continue in existing areas.

The Average Daily Traffic (ADT) on Whittlesey Road for Year 2008 is estimated at 21,000. The ADT for the design year (2028) is 32,600. The Level of Service (LOS) for the No-Build Alternative ranges from a LOS of "B," "C," "E" and "F" for Year 2008 to a LOS "C," "D," "B," and "F" in 2028 respectively. The increase in ADT on Whittlesey Road demonstrates the need for additional road capacity.

The best LOS is "A", which occurs when the density is the lowest and the average speed is nearly equal to the free flow speed. LOS of "B" indicates that traffic has reasonably free flow and speeds at the free-flow speed are generally maintained, while LOS of "C" occurs when the density increases and the average speed decreases. LOS "D" is the level at which speeds begin to decline slightly with increasing flows. Level of Service "E" indicates that traffic flow is very susceptible to congestion and passing impediments where operations are at capacity and are volatile because there are virtually no usable gaps in the traffic streams. The worst LOS, "F", occurs when the density is great and the average speed is low.

Both Veterans Parkway and Bradley Park Drive, which are termini of Whittlesey Road, are roadways with at least two travel lanes in each direction. The ADT for 2008 and 2028 at these two terminal intersections and other major intersections along Whittlesey Road are summarized below.

**Average Daily Traffic (ADT) for 2008 and 2028**

<b>Side Road</b>	<b>ADT (2008)</b>	<b>ADT (2028)</b>
Bradley Park Drive (just east of US 80)	33,000	51,000
Whitesville Road	15,500	25,000
Bradley Park Drive (east of Ashwood Drive)	7,800	10,900
Veterans Parkway	33,000	48,400
Weems Road (commercial area)	23,500	33,500
Weems Road (residential area)	11,500	16,700

## PROJECT TERMINI

The STP-8060(2) and STP-0005-00(749) project termini are logical in that the Whittlesey Road proposed project corridor extends from Bradley Park Drive, an urban minor arterial, to Veterans Parkway, an urban principal arterial. Bradley Park Drive and Veterans Parkway carry the largest volume of traffic and are two of the main connectors to the North Bypass.

The western project terminus, Bradley Park Drive, is logical because it would accommodate the extensive traffic turning movements at the Whittlesey Road/Bradley Park Drive intersection, the vehicles traveling between US 80 and the commercial development, and would provide continuous capacity improvements along the full extent of Whittlesey Road. The major turning movements at the Whittlesey Road/Bradley Park Drive intersection are summarized as follows: For the 2008 traffic volume projections, 86% (87% in 2028) of the traffic is expected to turn westbound onto Bradley Park Drive from Whittlesey Road southbound. In addition, 88% of the Bradley Park Drive 2008 projected traffic (89% in 2028) is expected to continue westbound through the Whittlesey Road/Bradley Park Drive intersection.

The eastbound Bradley Park Drive traffic is anticipated to be equally divided between continuing through the Whittlesey Road/Bradley Park Drive intersection and turning northbound onto Whittlesey Road (53% eastbound and 47% northbound, for both 2008 and 2028 projections). To summarize, the highest traffic volumes along Bradley Park Drive are expected to be west of the Whittlesey Road/Bradley Park Drive intersection. The high percentage of the projected westbound traffic that is anticipated to continue along Bradley Park Drive would be due to the Bradley Park Drive/US 80 interchange.

The project's eastern terminus, Veterans Parkway, is logical because traffic diminishes east of Veterans Parkway. Whittlesey Road to the east of Veterans Parkway becomes Weems Road. In the immediate vicinity east of the Veterans Parkway intersection, Weems Road is commercial, and then transitions to residential use as the road continues east. In the residential area of Weems Road, traffic counts are diminished, so there is no need for additional widening. On Weems Road in the vicinity of the commercial district, the projected 2008 ADT is 23,500 Vehicles Per Day (VPD) (33,500 VPD in 2028) and as Weems Road changes to residential land use, the projected 2008 ADT is 11,500 VPD (16,700 VPD in 2028). These termini are sufficient to both accommodate local businesses and residents, and provide access to the US 80/North Bypass via Bradley Park Drive and Veterans Parkway.

These projects have independent utility for capacity needs between urban collector streets and by providing a corridor access to state and interstate routes. Currently, vehicles traveling on Whittlesey Road accessing the US 80/North Bypass have three options: (1) use Veterans Parkway; 2) use Bradley Park Drive; or 3) use Whitesville Road (via Whittlesey Road).

The history of accidents on Whittlesey Road and the comparative statewide accident and injury rates for urban collectors are shown below.

## Accident History of Whittlesey Road

- Bradley Park Drive to Veterans Parkway

Year	Accident/ Accident Rate	Injury/ Injury Rate	Fatalities
1995	34/ <b>1,436</b>	19/ <b>802</b>	0
1996	24/ <b>1,013</b>	6/ <b>253</b>	0
1997	46/ <b>1,942</b>	19/ <b>802</b>	0
1998*	32/ <b>1,351</b>	8/ <b>338</b>	0
1999	Pending	Pending	Pending
2000	74/ <b>3,125</b>	17/ <b>718</b>	0
2001	107/ <b>4,518</b>	23/ <b>971</b>	0

\*1998 data are 62% complete as of October, 2003.

All rates are per 100 million vehicle miles of travel.

Numerical values in **bold** are higher than corresponding statewide rate.

According to available accident data, the accident and injury rates along the project corridor exceeded the statewide rates. In the latest year, year 2001, the accident rate along the project corridor was almost nine times the statewide rate and the injury rate was more than seven times the statewide injury rate for an urban collector street. The accident data support the need for the proposed project intersection improvements, because 95% of all accidents during 1995-1997 took place at intersections. The accidents that dominate throughout this corridor are angle-intersecting or rear-end collisions, which occurred in 74%, 88%, and 74% of the cases during the years 1995, 1996, and 1997, respectively. With the increase of traffic volumes expected for this corridor, accident rates and injury rates are anticipated to continue to exceed the statewide rates should the project not be built.

## REVISED PROJECT DESCRIPTION

Projects STP-8060(2) and STP-0005-00(749) in Muscogee County require a revised concept report due to a necessary change in project termini, typical sections, and traffic data. The western terminus, which was formerly located just west of the Whittlesey Road/Whitesville Road intersection, has been relocated farther west to the intersection of Whittlesey Road and Bradley Park Drive, just east of US 80, to correspond with traffic movements and volumes at the Bradley Park Drive/Whittlesey Road intersection. The eastern terminus will remain just east of the Whittlesey Road and Veterans Parkway intersection. The new terminus adds approximately 0.25 mile to the project length, making the proposed total length 1.3 miles. The typical section is being altered due to changes in the desired width for grass strip borders. The shoulder width has been changed from 12 feet to 16 feet along most of Whittlesey Road to accommodate the wider grass strip border. Traffic and LOS data have been updated from 2005/2025 projections to 2008/2028 projections. Accident data have also been updated in the Need and Purpose to correspond with the new project limits.

The revised concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Program (RTP) and the State Transportation Improvement Program (STIP).

## **PROJECT LOCATION**

Projects STP 8060(2) and STP-0005-00(749), Muscogee County will provide widening and reconstruction of Whittlesey Road (City Street (CS) 1618) for a distance of 1.3 miles. The projects begin at the intersection of Bradley Park Drive and Whittlesey Road, and extend east to a point just east of the Veterans Parkway intersection. Whittlesey Road is located in the City of Columbus, Georgia, approximately 0.5 miles south of the 1-185 and US 80/North Bypass interchange.

## **DESCRIPTION OF THE APPROVED CONCEPT**

The approved concept proposed to widen the existing two-lane Whittlesey Road to a four-lane urban section with a 20-foot raised median, 12-foot shoulders, including curb and gutter and 5-foot sidewalks. The existing right-of-way along Whittlesey Road varies from 70 to 100 feet. The proposed right-of-way along Whittlesey Road would be a minimum of 92 feet, and a maximum of 140 feet. The proposed features to be revised in the approved concept for STP-8060(2) & STP-0005-00(749) are the project termini, the typical sections, and traffic data.

The project termini in the approved concept report are from just west of Whitesville Road to just east of Veterans Parkway, a distance of 0.98 mile along Whittlesey Road.

The typical section in the approved concept report is an urban section with two, 12-foot lanes in each direction, a 20-foot raised median and 12-foot shoulders, including curb and gutter and 5-foot sidewalks on both sides.

## **REVISED FEATURE(S) TO BE APPROVED**

The western terminus is proposed to be modified from the intersection of Whittlesey Road and Whitesville Road to the intersection of Whittlesey Road and Bradley Park Drive (just east of US 80) based on existing and projected traffic data that support the change in logical termini. Project STP-0005-00(749) has been added to the Work Program and the RTP and refers to the project extension from Bradley Park Drive to just west of Whitesville Road for a distance of 0.32 miles. STP-8060(2) begins just west of Whitesville Road and continues along Whittlesey Road to just east of Veterans Parkway. The eastern terminus would remain the same as in the approved concept report. The revised project length is 1.3 miles. The revised western project terminus is logical because it would accommodate the extensive traffic turning movements at the Whittlesey Road/Bradley Park Drive intersection, the vehicles traveling between US 80 and the commercial development along Whittlesey Road, and would provide continuous capacity improvements along the full extent of Whittlesey Road.

The revised typical section will be an urban section with two 12-foot lanes in each direction, raised median and 16-foot shoulders, including curb and gutter, 6-foot grass strip borders and 5-foot sidewalks. Along the section of Whittlesey Road from West Hamilton Park Drive to just east of Veterans Parkway, the shoulder width would be reduced to 10 feet with 6-foot sidewalks and no grass strip border, thus reducing impacts to access for the commercial development in the vicinity of the Whittlesey Road and Veterans Parkway intersection. The 10-foot shoulder with no grass strip meets the criteria of the "Alternate Section without Grass Strip" Detail from the Department's Special Concrete Sidewalk Details, which has replaced the GA Standard 903 1W.

At the intersection of Whittlesey Road and Whitesville Road, the eastbound lanes would include two through lanes, two left turn lanes, and one right turn lane. The 20-foot raised median would begin at Bradley Park Drive at the western project terminus and continue along the entire length of the project.

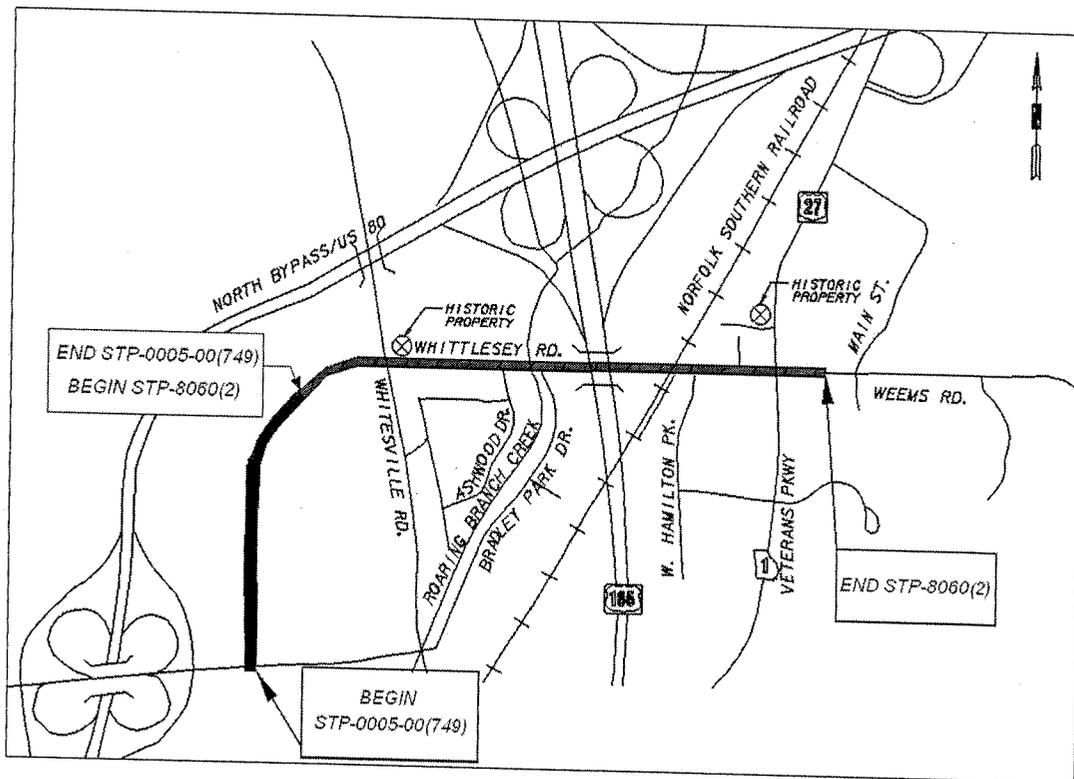
## CONSTRUCTION COSTS

The probable cost of construction for STP-8060(2), P. I. No. 351010, is based on the Estimate Report for file "351010\_STP-8060(2)\_2009-09-10" construction cost estimate which was prepared by Kisinger Campo and Associates Corporation dated September 10, 2009 that lists said cost as \$36,269,679. This figure is divided as follows: \$13,915,450 for construction and \$22,254,229 for right-of-way costs. In addition, the Department provided lump sum construction and right-of-way costs for STP-0005-00(749), P. I. No. 0005749 as \$3,770,826 and \$1,541,000 respectively, after adding corresponding markups. As such the grand total for the projects is \$17,686,275 in construction costs and \$23,895,229 in right-of-way costs.

## PROJECT LOCATION MAP

### WHITTLESEY ROAD WIDENING STP-8060(2) and STP-0005-00(749), MUSCOGEE COUNTY P. I. Nos. 351010 and 0005749

Not to scale



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# VALUE ANALYSIS AND CONCLUSIONS

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## INTRODUCTION

This section describes the value analysis procedures used during the value engineering study. It is followed by separate narratives and conclusions concerning:

- Value Engineering Workshop Agenda
- Value Engineering Workshop Participants
- Economic Data
- Cost Estimate Summary and Cost Histograms
- Function Analysis
- Creative Idea Listing and Judgment of Ideas

A systematic approach was used in the VE study and the key procedures involved were organized into three distinct parts: 1) preparation; 2) VE workshop; and 3) post-study. A Task Flow Diagram that outlines each of the procedures included in the VE study is attached for reference.

## PREPARATION EFFORT

Pre-study preparation for the VE effort consisted of scheduling study participants and tasks, gathering necessary background information on the facility, and compiling project data into a cost model and graphic cost histogram. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning operating needs, systems evaluations, basis of cost, soil conditions, and construction of the facility was also a part of the analysis.

## VALUE ENGINEERING WORKSHOP EFFORT

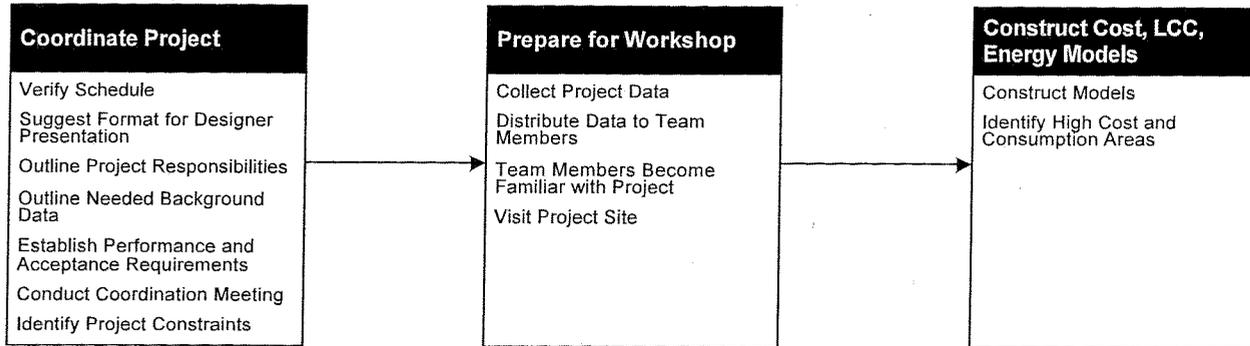
The VE workshop was a three and a half-day effort (see attached agenda). During the workshop, the VE job plan was followed. The job plan guided the search for high cost areas in the project and included procedures for developing alternative solutions for consideration. It includes six phases:

- Information Phase
- Function Identification and Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

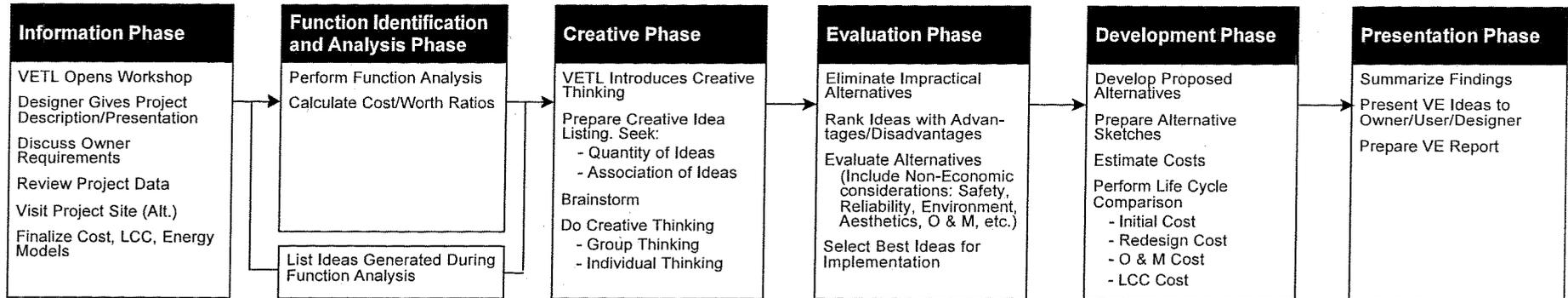


# Value Engineering Study Task Flow Diagram

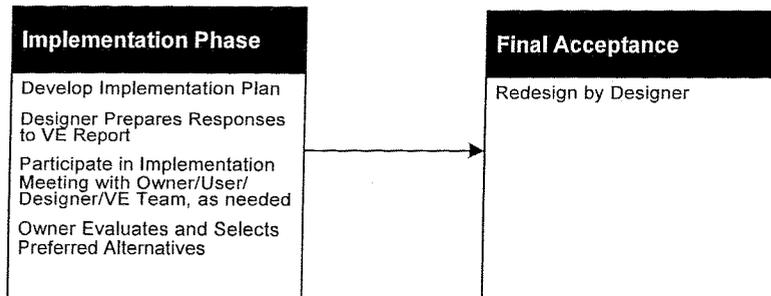
## Preparation Effort



## Workshop Effort



## Post-Workshop Effort



## Information Phase

At the beginning of the study, the conditions and decisions that have influenced the development of the project must be reviewed and understood. For this reason, the development manager presented information about the project to the VE team on first day of the session. Following the presentation, the VE team discussed the project using the following documents:

- Revised Project Concept Report, Department of Transportation, State of Georgia, Interdepartment Correspondence, Office of Urban Design for STP-8060(2) and STP-0005-00(749), Muscogee County, P. I. Nos. 351010 and 0005749; dated January 21, 2004;
- Incomplete Half Size Construction Plans entitled Plan and Profile of Proposed Widening and Reconstruction of Whittlesey Road; Muscogee County; P. I. No. 351010; prepared by Kisinger Campo and Associates Corporation, September 10, 2007;
- Complete Full Size Construction Plans entitled Plan and Profile of Proposed Widening and Reconstruction of Whittlesey Road; Muscogee County; P. I. No. 351010; prepared by Kisinger Campo and Associates Corporation, September 10, 2007;
- Estimate Report for File “351010\_STP-8060(2),\_2007-09-10” for project STP-8060(2); P. I. No. 351010; prepared by Kisinger Campo and Associates Corporation, dated September 10, 2007;
- Preliminary Right of Way Cost Estimate, prepared by the Department of Transportation for STP-8060(2) Muscogee, P. I. No. 351010, dated October 19, 2005;
- Capacity Analysis for project STP-8060(2); P. I. No. 351010; dated October 24, 2005;
- Accident Rates for project STP-8060(2); P. I. No. 351010; dated November 12, 2004;
- Soils Survey Summary for project STP-8060(2); P. I. No. 351010; Whittlesey Road from Whitesville Road to Veterans Parkway; prepared by the State of Georgia, Department of Transportation; dated January 14, 2005;
- Flexible Pavement Design Analysis for project STP-8060(2); P. I. No. 351010; Whittlesey Road from Whitesville Road to Veterans Parkway; prepared by the State of Georgia, Department of Transportation; dated January 14, 2005; and
- General Highway Map, Muscogee County, Georgia, prepared by the Department of Transportation, Division of Planning and Programming, Planning Data Services, in cooperation with the U. S. Department of Transportation, Federal Highway Administration; dated 1985.

## Function Identification and Analysis Phase

Based on historical and background data, a cost model and graphic function analysis were developed for this project by major construction elements. They were used to distribute costs by project element; serve as a basis for alternative functional categorization; and to assign worth to the categories, where worth is the least cost to provide the required function, as determined by the VE team. The VE team identified the functions of the various project elements and subsystems by using random function generation techniques resulting in the attached Random Function Analysis worksheet and Function Analysis Systems Technique (F.A.S.T.) diagram.

## Creative Phase

This VE study phase involved the creation and listing of ideas. Creative idea worksheets were organized by project element. During this phase, the VE team developed as many ideas as possible to provide the necessary functions within the project at a lower cost to the owner, or to improve the

quality of the project. Judgment of the ideas was restricted at this point. The VE team was looking for a large quantity of ideas and association of ideas.

GDOT and KCA representatives may wish to review the creative list since it may contain ideas that can be further evaluated for potential use in the design.

### **Evaluation Phase**

During this phase of the workshop, the VE team judged the ideas generated during the creative phase. Advantages and disadvantages of each idea were discussed to find the best ideas for development. Ideas found to be irrelevant or not worthy of additional study were discarded. Those that represented the greatest potential for cost savings or improvement to the project were then developed further.

The VE team would like to develop all ideas, but time constraints usually limit the number that can be developed. Therefore, each idea was compared with the present schematic design concepts, in terms of how well it met the design intent. Advantages and disadvantages were discussed, and each team member rated the ideas on a scale of 1 to 5, with the best ideas rated 5. Total scores were summed for each idea and only highly-rated ideas were developed into alternatives. In cases where there was little cost impact, but an improvement to the project was anticipated, the designation DS, for design suggestion, was used. The design team should review this listing for possible incorporation of ideas into the project.

The creative listing was re-evaluated frequently during the process of developing alternatives. As the relationship between creative ideas became more clearly defined, their importance and ratings may have changed, or they may have been combined into a single alternative. For these reasons, some of the originally high-rated items may not have been developed into alternatives.

### **Development Phase**

During the development phase, each highly rated idea was expanded into a workable solution. The development consisted of a description of the alternative, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed alternatives. Each alternative was written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, were also prepared in this part of the study. The VE alternatives are included in the Study Results section.

### **Presentation Phase**

The last phase of the VE study was the presentation of the findings. The VE alternatives were screened by the VE team before draft copies of the Summary of Potential Cost Savings worksheets were provided to GDOT and KCA representatives during an informal presentation on the last day of the study. The VE alternatives were arranged in the same order as the idea listing sheets to facilitate cross-referencing

## **POST-WORKSHOP EFFORT**

The post-study portion of the VE study includes the preparation of this Value Engineering Study Report. Personnel from GDOT and KCA will analyze each alternative and prepare a short response, recommending either incorporating the alternative into the project, offering modifications before implementation, or presenting reasons for rejection. Lewis & Zimmerman Associates, Inc. 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.

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## VALUE ENGINEERING STUDY AGENDA

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Lewis & Zimmerman Associates, Inc. (LZA) will conduct a 28-hour Value Engineering (VE) study on the following projects: STP-8060(2), P. I. No. 351010 and STP-0005-00(749), P. I. No. 0005749, WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD. The projects are located in Muscogee County, Georgia. It is expected the owner, the Georgia Department of Transportation (GDOT) and the design consultant, Kisinger Campo and Associates Corporation (KCA), will be available to make a formal presentation concerning the project at the beginning of the workshop and be available to answer questions during the VE study effort.

### VE Study Agenda

The VE study will follow the outline described below and be conducted September 24 - 27, 2007. The study will be conducted in the Engineering Services' Conference Room, Room 264 of GDOT's General Office located at No. 2 Capitol Square Street, Atlanta, Georgia 30334. The point-of-contact is Ms. Lisa L. Myers, Design Review Engineer Manager, and Value Engineering Coordinator, who can be reached at 404-651-7468.

### Monday, September 24<sup>th</sup>

9:00 am – 9:15 am                      **General Introduction of all Parties and review of the VE Process**

9:15 am - 11:15 am                      **Owner's/Designer's Presentation**

GDOT and KCA are to present information concerning the projects including, but not necessarily limited to: rationale for design, criteria for specific areas of study, project constraints, and the reasons for design decisions.

11:15 am - 12:00 noon                      **Commence Function Analysis Phase**

The VE team will continue their familiarization with the cost models and project data for each area of study. The cost model(s) will be refined, as necessary; define the function of each project element or system in the cost model, select the primary or basic functions, and determine the worth, or least cost, to provide the function. Cost/worth or value index ratios will be calculated, and high cost/low worth areas for study identified. In addition, the VE team will continue defining the function of each element/system to gain a thorough understanding of the project's needs and requirements.

12:00 noon - 1:00 pm                      **Lunch**

1:00 pm - 5:00 pm                      **Conclude the Function Analysis Phase and Commence the Creative Phase**

The VE team will conduct a brainstorming session and list as many ideas as possible for consideration. The aim is to obtain a large quantity of ideas through free association, by eliminating roadblocks to creativity and deferring judgment.

**Tuesday, September 25<sup>th</sup>**

8:30 am - 10:00 am                      **Conclude Creative Phase and Complete Evaluation/Analytical Phase**

The VE team will analyze the ideas listed in the creative phase and select the best ideas for further development.

10:00 am - 12:00 noon                  **Development Phase**

VE team will develop creative ideas into alternate design solutions. Initial and life cycle cost estimates comparing original and proposed alternatives will be prepared. Selected alternatives for change will be developed and supported with sketches, calculations and written substantiation.

12:00 noon - 1:00 pm                  **Lunch**

1:00 pm - 5:00 pm                      **Continue Development Phase**

**Wednesday, September 26<sup>th</sup>**

8:30 am - 12:00 am                      **Continue Development Phase**

12:00 noon - 1:00 pm                  **Lunch**

1:00 pm - 4:00 pm                      **Conclude Development Phase**

4:00 pm – 5:00 pm                      **Commence Summary Worksheets for Information oral Presentation**

Upon completion of the Development Phase, the VE facilitator will commence preparation of the summary worksheets based on the alternatives developed by the VE team. The summary worksheets will form the basis of the informal oral presentation.

**Thursday, September 27<sup>th</sup>**

8:00 am - 9:00 am                      **Finalize Summary Worksheets and Prepare for Oral Presentation Strategies**

9:00 am – 11:00 am                      **Informal Oral Presentation**

The VE team presents its alternatives to the owner and design team representatives and is available to clarify any points. The process for accepting/rejecting VE alternatives is described and a target schedule for meeting to finalize implementation decisions is established.

11:00 am                                      **Adjourn**

## **VALUE ENGINEERING WORKSHOP PARTICIPANTS**

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The VE team was organized to provide specific expertise on the unique project elements involved. Team members consisted of a multidisciplinary group with professional design experience and a working knowledge of VE procedures. The VE team included the following professionals:

Tony R. Bradley, PE	Roadway Engineer	ARCADIS U.S., Inc.
Harley G. Griffin	Construction Specialist/ Transportation Engineer	Delon Hampton and Associates
Luis M. Venegas, PE, CVS, LEED® AP, FSAVE	Value Engineer Facilitator/ Team Leader	Lewis & Zimmerman Associates

### **OWNER'S/DESIGNER'S PRESENTATION**

GDOT and KCA, the design team, presented an overview of the projects on Monday, September 24, 2007. The purpose of this meeting, in addition to being an integral part of the Information Gathering Phase of the VE study, was to bring the VE team up-to-speed regarding the overall project. Additionally, the meeting afforded the design team the opportunity to highlight in greater detail, those areas of the project requiring additional or special attention.

### **VALUE ENGINEERING TEAM'S FINAL PRESENTATION**

The VE team conducted an oral presentation on Thursday, September 27, 2007 to GDOT and KCA representatives. Copies of the draft Summary of Potential Cost Savings worksheets were provided for interim use by GDOT and KCA personnel.

A copy of the meeting participants is attached for reference.

# VALUE ENGINEERING ATTENDEES

## MEETING PARTICIPANTS



<b>PROJECT: STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749</b> <b>WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD</b> <b>Muscogee County, GDOT</b> <i>Design Development Stage</i>		Date: <b>September</b> <b>24 -27, 2007</b>
NAME & E-MAIL (PLEASE PRINT)	ORGANIZATION/TITLE	PHONE/FAX
Name: Jill Franks, PE GDOT Employee No.: em: jill.franks@dot.state.ga.us	Organization: Georgia Department of Transportation (GDOT), Office Urban Design Title: Project Manager	ph: 404-656-5442 cell: fx:
Name: Charles (Chuck) A. Hasty, PE GDOT Employee No.: em: chuck.hasty@dot.state.ga.us	Organization: GDOT, Office Urban Design Title: Transportation Engineer Assistant Administrator	ph: 404-656-5454 cell: fx: 404-657-7921
Name: James (Mag) Magnus, CPESC GDOT Employee No.: em: james.magnus@dot.state.ga.us	Organization: GDOT, Office Urban Design Title: Assistant State Construction Engineer	ph: 404-656-5306 cell: fx: 404-656-3507
Name: Gerald (Jerry) A. Milligan GDOT Employee No.: em: jerry.milligan@dot.state.ga.us	Organization: GDOT, Office of Right of Way Title: Supervisor Appraisal Estimator	ph: 770-986-1541 cell: fx: 770-986-1558
Name: Lisa L. Myers GDOT Employee No.: em: lisa.myers@dot.state.ga.us	Organization: GDOT, Engineering Services Title: Design Review Engineer Manager, Value Engineering Coordinator	ph: 404-651-7468 cell: fx: 404-463-6131
Name: Emmanuella Myrthil GDOT Employee No.: em: emmanuella.myrthil@dot.state.ga.us	Organization: GDOT, Office of Environmental / Location (OEL) Title: Transportation Environmental Planner Assistant	ph: 404-699-6967 cell: fx: 404-699-4440
Name: Neal O'Brien GDOT Employee No.: em: neal.obrien@dot.state.ga.us	Organization: GDOT, Office of Urban Design Title: Design Group Manager	ph: 404-656-5442 cell: fx: 404-657-7921
Name: Jason O'Neal GDOT Employee No.: em: Jason.oneal@dot.state.us	Organization: GDOT, Office Urban Design Title: Civil Engineer Technologist	ph: 404-656-5442 cell: fx:
Name: Wayne Pittman GDOT Employee No.: em: wyane.pittman@dot.state.ga.us	Organization: GDOT, District 3, Columbus Title: Area Engineer	ph: 706-568-2165 cell: 706-741-3456 fx:
Name: Laura Rish GDOT Employee No.: em: laura.rish@dot.state.ga.us	Organization: GDOT, OEL Title: Transportation Environmental Planner	ph: 404-699-4439 cell: fx: 404-699-4440

# VALUE ENGINEERING ATTENDEES

## MEETING PARTICIPANTS



<b>PROJECT: STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749</b> <b>WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD</b> <b>Muscogee County, GDOT</b> <i>Design Development Stage</i>		Date: <b>September 24 -27, 2007</b>
NAME & E-MAIL (PLEASE PRINT)	ORGANIZATION/TITLE	PHONE/FAX
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Name: Luis M. Venegas, PE, CVS-Life, LEED® AP, FSAVE GDOT Employee No.: em: lvenegas@lza.com	Organization: Lewis & Zimmerman Associates, Inc. Title: Value Engineer Facilitator	ph: 770-992-3032 cell: 678-488-4287 fx: 770-435-2666
Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:
Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:
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Name: GDOT Employee No.: em:	Organization: Title:	ph: cell: fx:

## ECONOMIC DATA

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The VE team developed economic criteria used for evaluation with information gathered from the State of Georgia Department of Transportation and Kisinger Campo and Associates Corporation. To express costs in a meaningful manner, the VE team alternatives are presented on the basis of discounted present worth. Criteria for planning project period interest rates are based on the following parameters:

Year of Analysis:	2007
Construction Start Up:	±2008 (December)
Construction Duration:	±24 Months (December 2010)
Economic Planning Life:	35 years for Pavement
Economic Planning Life:	50 years for Bridges
Discount Rate/Interest:	2.50% (Extrapolated from latest United States Office of Management and Budget Circular A-94, Appendix C – January 2007)
Inflation/Escalation Rate:	8.00% (Per GDOT)
Uniform Present Worth (UPW) Factor:	23.1452 for 35 years 28.3623 for 50 years
Cost of Power:	\$0.07/kWhr (kilowatt hour) (assumed)
Operation and Maintenance Costs (Industry Norms):	
Equipment - With Many Moving Parts	5.00%-5.50%+ of Capital Cost
Equipment - With Minimal Moving Parts	3.50%-4.00% of Capital Cost
Equipment - Electronic	3.00% of Capital Cost
Structural	1.00%-2.00% (or less) of Capital Cost
Composite Mark-Up for Construction:	25.86% (1.2586)
(Composed of: Engineering and Construction at 10.00% and Escalation at 14.42% based on 8.00% per annum for 1.75 years to mid-point of construction.)	
Composite Mark-Up (Right-of-Way):	247.20% (3.4720)
(Composed of: Scheduling Contingency at 55.00%; Administration/Court Costs at 60.00%; and Inflation Factor at 40.00 %.)	

## **COST MODEL**

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The VE Team Leader prepared a cost model for the project that follows this page. The cost model is arranged in the Pareto Charting/Cost Histogram format to aid in identifying high cost areas and is based on the Estimate Report for file “351010\_STP-8060(2)\_2009-09-10” construction cost estimate which was prepared by Kisinger Campo and Associates Corporation dated September 10, 2007. In addition, the lump sum costs for STP-0005-00(749), P. I. 0005789 were provided to the VE team by the Department. As can be expected, judgments at this stage of the study are based on experience and intuition rather than facts, which are not uncovered until well along in the analysis of function. As a result of these qualified hypotheses, there appears to be a potential for initial savings in the following areas:

- Roadway
  - Recycled Asphaltic Concrete
  - Graded Aggregate base Course
  - Class A Concrete
  - Traffic Control
- Signal
  - Traffic Signal Installation
  - Traffic Signal Timing
  - Strain Poles
- Erosion Control
  - Inlet Sediment Traps
  - Water Quality Inspections
  - Construction Exits
- Traffic Signs and Markings
  - Changeable Message Sign
  - Strain Poles
  - Thermoplastic Striping

## **DESIGNER’S COST ESTIMATE**

The cost estimate, as described above, did contain sufficiently detailed information to perform the value engineering effort. However, the following caveats are noted:

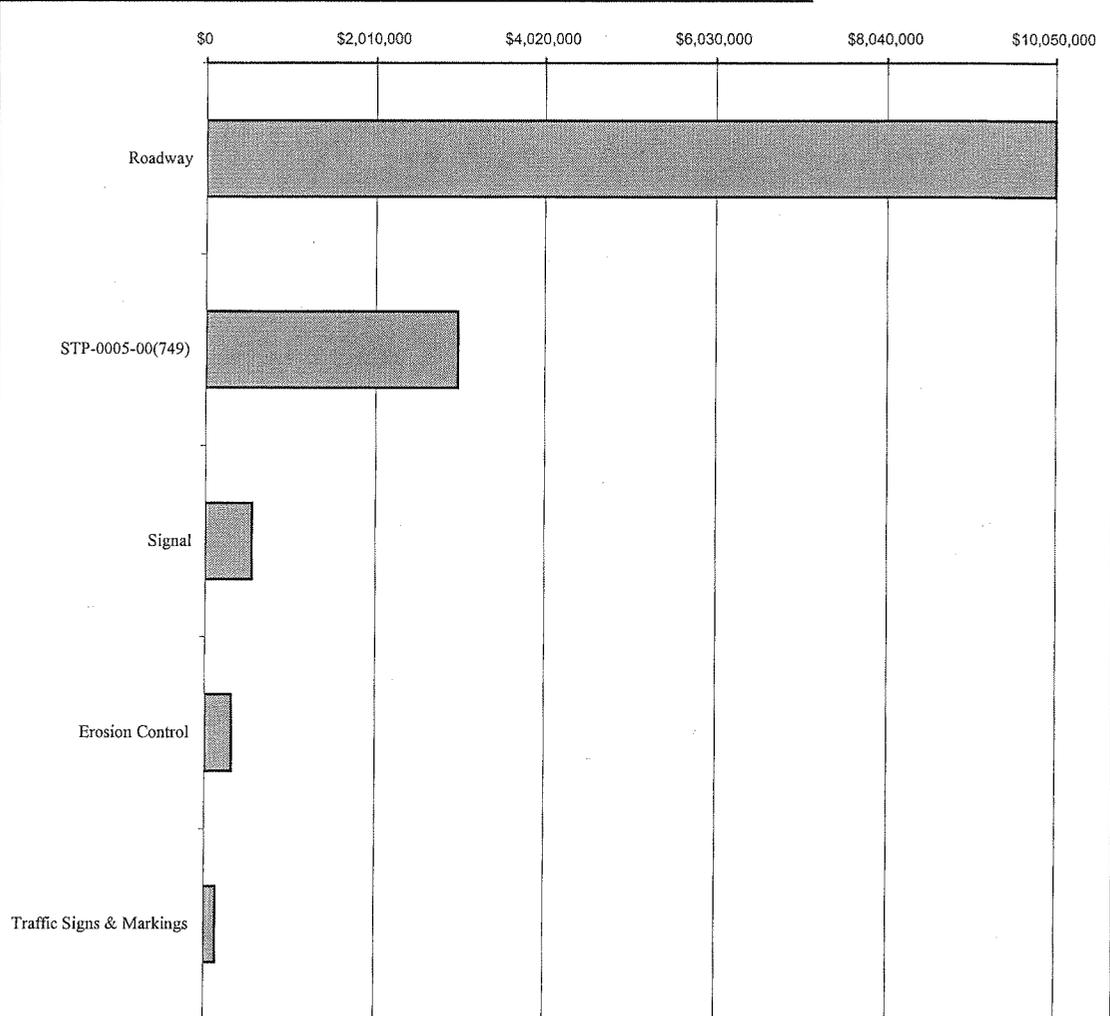
- No detailed cost estimate was provided for STP-0005-00(749), P. I. No. 0005749 – only a lump sum;
- No detailed right-of-way costs were provided for STP-0005-00(749), P. I. No. 0005749 - only a lump sum;
- Units prices for STP-8060(2), P. I. 351010 were used for STP-0005-00(749), P. I. No. 0005749 alternatives;
- No Engineering and Construction markup for either project was provided so it was added to the project totals (see Cost Histogram); and
- No Escalation was included in either project so it was derived and added to the protect totals (see Cost Histogram).

# COST HISTOGRAM



Project: **STP-8060(2), P. I. No. 351010 and STP-0005-00(749), P. I. No. 005749**  
**WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD**  
**Muscogee County, Georgia Department of Transportation, District 3**  
*Design Development Stage*

TOTAL PROJECT	COST	PERCENT	CUM. PERCENT
Roadway	10,049,718	71.52%	71.52%
STP-0005-00(749)	2,996,000	21.32%	92.84%
Signal	552,151	3.93%	96.77%
Erosion Control	315,708	2.25%	99.01%
Traffic Signs & Markings	138,540	0.99%	100.00%
<b>Construction Subtotal</b>	<b>\$ 14,052,117</b>	<b>100.00%</b>	
Engineering and Construction at 10.00%	\$ 1,405,212		
Inflation Based on 8.00% per annum for 1.75 Years 14.42%	\$ 2,228,947		
<b>Construction Total</b>	<b>\$ 17,686,275</b>		
		Mark-Up: 25.86%	
Right-of-Way Costs; STP-8060(2)	\$ 6,438,430		
Right-of-Way Costs; STP-0005-00(749)	\$ 443,836		
<b>Right-of-Way Subtotal</b>	<b>\$ 6,882,266</b>		
Scheduling Contingency 55.00%	\$ 3,785,247		
Administration / Court Costs 60.00%	\$ 6,400,508		
Inflation Factor 40.00%	\$ 6,827,208		
<b>Right-of-Way Total</b>	<b>\$ 23,895,229</b>		
		Mark-Up: 247.20%	
<b>GRAND TOTAL</b>	<b>\$ 41,581,504</b>		



**Costs in graph are not marked-up.**

\* Escalation rate was provided by the Department based on recent history.

## FUNCTION ANALYSIS

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Function Analysis was performed to: define the requirements for each project element and ensure a complete and thorough understanding by the VE team of the basic function(s) needed to attain a given requirement. A Random Function Analysis worksheet for the project is attached. This part of the function analysis stimulated the VE team members to think in terms of the areas in which to channel their creative idea development.

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. These elements add cost to the final product, but have a relatively low worth to the basic function.

In addition to the random function analysis, the VE Team Leader worked with members of the study team to develop a Function Analysis System Technique (F.A.S.T.) diagram for each phase. The F.A.S.T. diagram was used to show the flow of function within the phases. It helped confirm the project is addressing those issues that have been voiced by the owner as being important. The diagram was generated by asking the key question: "What is the most important function to be accomplished by this phase?" The answer is characterized by a verb/noun pair. In turn, another question is asked: "Why?" The answer is again listed in a verb/noun pair, and the process continued from left to right. If the result is a true F.A.S.T. diagram, the flow of functions from right to left will answer the question "Why?" No F.A.S.T. diagram is ever completed. The readers of this report may wish to challenge themselves to see how far they can carry the construction of the F.A.S.T. diagram.

This F.A.S.T. diagram notes the critical function paths and identifies the project's basic functions as INCREASING/CAPACITY by Managing Traffic/Conflicts and Managing/Access, and IMPROVING/SAFETY. The F.A.S.T. diagram is attached.



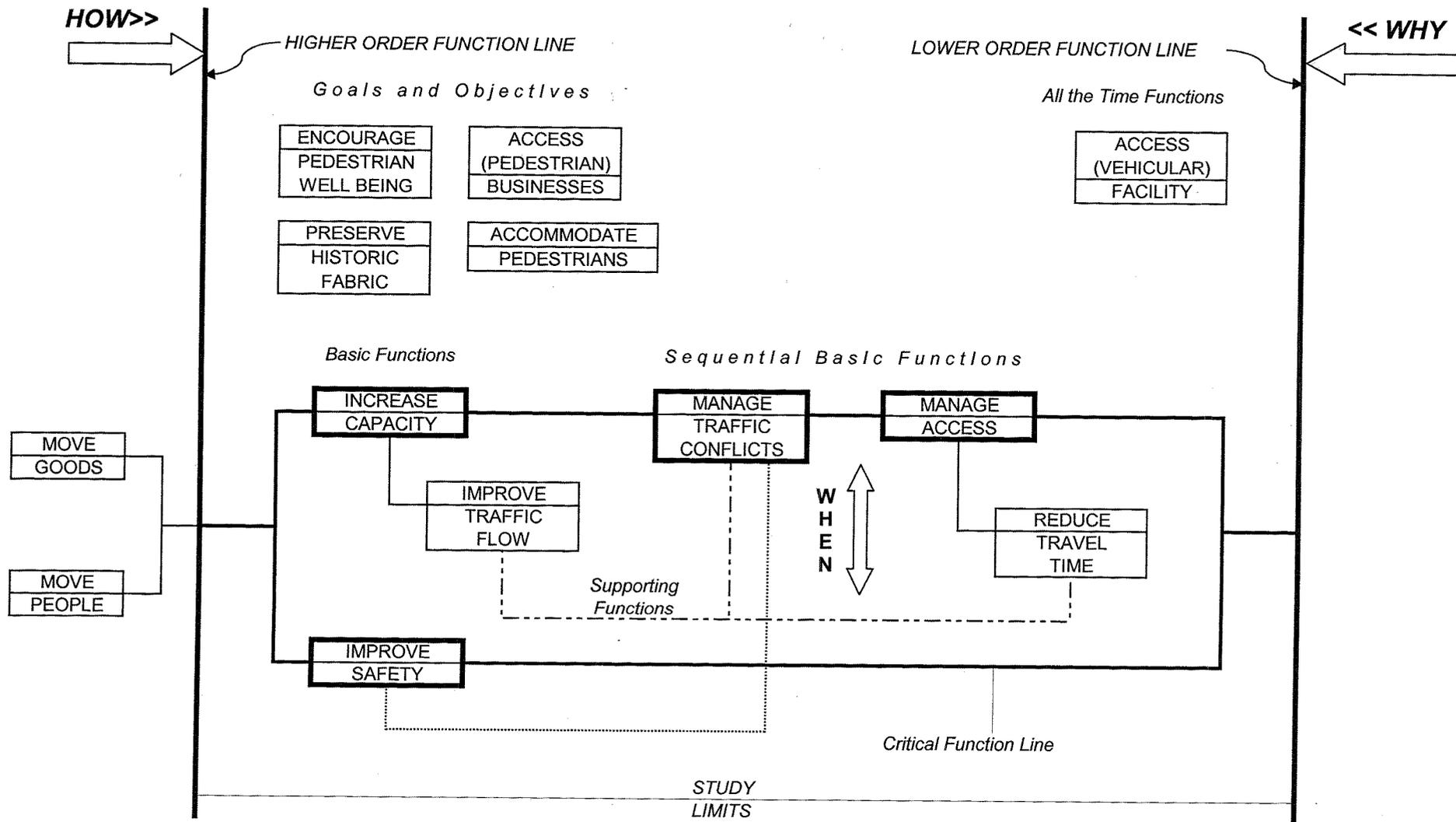
FUNCTION ANALYSIS SYSTEMS TECHNIQUE (F. A. S. T.)

**Widening and Reconstruction of Whittlesey Road**



STP-8060(2), P.I. No. 350101 & STP-0005-00(749), P.I. No. 005749

Georgia Department of Transportation, District 3  
City of Columbus, Muscogee County, Georgia



## **CREATIVE IDEA LISTING AND JUDGEMENT OF IDEAS**

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During the Creative Phase, numerous ideas, alternative proposals and/or recommendations were generated using conventional brainstorming techniques as recorded on the following pages.

These ideas were discussed and the advantages/disadvantages of each listed. The VE team compared each of the ideas with the concept solution determining whether it improved value, was equal in value, or lessened the value of the solution.

The ideas were ranked on a scale of 1 to 5 on how well the VE team believed the idea met necessary criteria and program needs. The higher rated ideas were then developed into formal alternatives and included in the VE workshop. Some ideas were judged to have minimal cost impacts on the project but provided enhancements in the form of improved operations, efficiency, constructibility or potential to save unknown or hidden costs. These were given the designation "DS" which indicates a design suggestions. This designation is also used when an idea is difficult to price but improves the functionality of the project or system, and is deemed to be of significant value to the owner, user, operator or designer.

Typically, all ideas rated 4 or 5 are included in the Study Report. When this is not the case, an idea was combined with another related idea or discarded, as a result of additional research that indicated the concept as not being cost-effective or technically feasible.

All readers are encouraged to review the Creative Idea Listing and Evaluation worksheets since they may suggest additional ideas that can be applied to the design.

# CREATIVE IDEA LISTING



PROJECT: <b>STP-8060(2), P. I. No. 351010 AND STP-0005-00(749), P. I. No. 0005749</b> <b>WIDENING AND RECONSTRUCTION OF WHITTLESEY ROAD</b> <b>Muscogee County, GDOT</b> <i>Design Development Stage</i>		SHEET NO.: 1 of 1
NO.	IDEA DESCRIPTION	RATING
1	Use 12-foot shoulders in lieu of 16-foot shoulders	5
2	Eliminate all sidewalks	4
3	Selectively retain sidewalks	4
4	Close off West Hamilton Park Drive	4
5	Allow right-in/right-out only at West Hamilton Park Drive	4
6	Have the City pay for the sidewalks	4
7	Close off Bradley Park Drive	4
8	Allow right-in/right-out only at Bradley Park Drive	4
9	Eliminate west end of the projects from Whittlesey Road to Bradley Park Drive and improve the intersections at Whittlesey Road and Whitesville Road and Whittlesey Road and Bradley Park Drive	5
10	Narrow the median underneath I-185	3
11	If Alternative Nos. 4 and 7 are accepted, use a narrower median from US 27/Veterans Parkway/Martha Berry Highway to Whitesville Road	4
12	Reduce superelevation from 6% to 4%	DS
13	Narrow the median throughout the project	4
14	Use a flush median throughout	5
15	Use parapet retaining walls in lieu of gravity walls	4
16	Increase the southbound left turn lane at US 27/Veterans Parkway/Martha Berry Highway onto Whittlesey Road	4
17	Where existing pavement use retained, use a monolithic median pour in lieu of curb and gutter and separate median pour	3
18	Use a precast arch in lieu of the dual box culverts	4
19	Retain the eastern most parcels in the proposed "green space" (Parcel Nos. 16, 17 and 19)	3
20	Take Parcel No. 12 and incorporate into the "green space"	4
21	Increase the radii intersections from 35 feet to 50 feet	4
22	Raise the profile of the facility from STA 52+09 (railroad crossing) to STA 61+90 US 27/Veterans Parkway/Martha Berry Highway)	4
23	Use 10-foot shoulders throughout	4
Rating: 1 → 2 = Not to be Developed;      3 - 4 = Varying Degree of Development Potential;      5 = Most Likely to be Developed; DS = Design Suggestion;      ABD = Already Being Done;      N/A = Not Applicable		