

# VALUE ENGINEERING REPORT

Projects No. STP00-0002-00(409) and NH000-0006-02(056)

SR 300/SR 520 / US 82 Clark Avenue between Turner Field Road and  
SR 62 Cordele Road Improvements  
and  
SR 3 / Liberty Expressway @ Clark Avenue Ramps and Turn Lanes  
Improvements

PIs No. 0002409 and 422560

Dougherty County

November 16, 2010

OWNER AND DESIGN TEAM:



Georgia Department of Transportation  
600 West Peachtree Street  
Atlanta, GA 30308

VALUE ENGINEERING CONSULTANT:



MACTEC Engineering and Consulting, Inc.  
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Kennesaw, GA 30144

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**and**

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## **EXECUTIVE SUMMARY**

# **Executive Summary**

## **Value Engineering Study**

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**SR 300/SR 520 / US 82 Clark Avenue between Turner Field Road and SR 62  
Cordele Road Improvements**

**and**

**SR 3 / Liberty Expressway @ Clark Avenue Ramps and Turn Lanes  
Improvements**

PI Nos. 0002409 and 422560

**Dougherty County**

### **Introduction**

This report presents the results of a value engineering (VE) study conducted on the concept level design for two projects in the same area within the city limits of Albany, GA. The first includes the improvements of Clark Avenue from Turner Field Road to Cordele Road and the second, located just west of the first project, includes improving the exit ramps from and entrance ramps to SR3 / Liberty Expressway at the interchange with Clark Road. This project is located approximately 180 miles south of Atlanta.

The proposed changes to the Clark Avenue project include reconstruction of the 1.20 mile section from an existing 5-lane urban section to a six lane urban section. The typical section would include three 11 foot travel lanes in each direction, a 16 foot raised median, and 16 foot shoulders including an 8-foot multi-use path on the south side and a 5-foot wide sidewalk on the north side of the roadway. The estimated project cost for this project is \$14,123,000 including construction cost of \$9,717,000, right of way of \$3,163,000, utilities of \$131,000, fuel and AC adjustments of \$629,000 and E&I of \$483,000.

The second 0.65 mile project, the intersection improvement project includes for the SR 3 southbound ramps the addition of two 12 foot wide exit lanes added to the existing 12 foot wide entrance lane separated by an 11 foot wide raised median; 12 foot wide shoulders (8 feet paved, 4 feet grassed). The right turn lane to the southbound entrance ramp will be extended.

The SR 3 northbound ramps will have two 12 foot wide exit lanes added and one 12 foot wide entrance lane added, separated by an 11 foot wide raised median; 12 foot wide shoulders (8 feet paved, 4 feet grassed). The project cost for this project is estimated to be \$5,589,000, including construction cost of \$3,765,000, right of way of \$1,276,000, utilities of \$100,000, fuel and AC adjustments of \$260,000 and E&I of \$188,000.

The study took place November 1-4, 2010, at the Georgia DOT headquarters Office in Atlanta using a three person VE team. It was conducted at the preliminary design level design of these capacity and safety related improvements.

This report presents the Team's recommendations and all back-up information for consideration by the decision-makers. This Executive Summary includes a brief description of each recommendation. The Study Identification section contains information about the project and the team. The Recommendations section presents a more detailed description and support information about each recommendation. The Appendix includes a complete record of the Team's activities and findings. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.

## **Results Obtained**

The VE team focused their efforts on the high cost items of the project. Through the use of function analysis and "brain storming" techniques, the team generated 32 ideas with 24 being identified for additional evaluation as possible recommendations or design suggestions. The VE team developed 17 recommendations for consideration by the design team. Neglecting the overlapping nature of the recommendations as much as possible, the net total of all the recommendations have the potential to reduce project costs by as much as \$3,971,000 in capital cost savings while continuing to provide the required functionality. This is shown in the last column of the Summary Tables that follows the summary description below.

A brief presentation of these recommendations was conducted on November 4th at the GDOT General Office. See Appendix C for a listing of those in attendance. A summary of the recommendations follows.

## **Recommendation Highlights**

**A-1: Reuse existing pavement.** This recommendation proposes to rehabilitate and resurface the existing pavement where feasible. This pertains to the 33 foot wide EB section of the project only. This idea was presented for evaluation by District 4 staff at the kickoff presentation.

*The total potential savings if accepted is \$1,126,000*

**A-2: Remove full depth pavement section under the median.** This recommendation proposes to use a raised grass median with curb and gutter with no pavement being installed under the median area.

*If accepted the savings would amount to \$670,000*

**A-2.1: Reduce full depth pavement thickness under the median.** This recommendation is similar to A-2 except the pavement section is reduced, not eliminated. It is of adequate strength to support the temporary traffic during staging.

*Potential savings are \$177,000*

**A-4: Reduce depth of pavement section on ramp shoulder.** This proposal is to reduce the pavement section on the ramp shoulder which is currently the same as is installed on the ramps. This will still allow the function of supporting occasional traffic not the mainline traffic.

*Savings potential is \$43,000*

**A-7: Reduce depth of pavement section on Cordele Road.** Originally the section was shown as the same as Clark Road. This idea proposes to reduce the section because the traffic volumes are significantly lower on Cordele Road.

*Potential saving is \$269,000*

**A-7.1: Implement mill and inlay on Cordele Road.** Implementing the suggestion presented in the 2009 pavement evaluation report would yield these savings.

*If accepted, savings is \$669,000*

**B-1: Narrow the shoulder width to twelve feet.** The existing design uses a standard 16 foot wide urban shoulder. The proposed change is to reduce the shoulder width to twelve feet retaining the curb and gutter and sidewalk. This is proposed for both sides of the roadway. Savings results in earthwork and right of way.

*Potential for cost avoidance is \$318,000*

**B-4: Shift SR 300 / Clark Avenue to the north in the vicinity of the water tower.** The current design shifted the alignment to the south 20 feet to minimize impacts on the water tower. This resulted in curves being added to the alignment, complicated the project phasing causing the addition of temporary pavement construction. The proposed idea is to restore the original layout maintaining the tangent alignment in the vicinity of the water tower. This will eliminate the need for traffic shifting and temporary pavement.

*Potential savings is \$273,000*

**B-6: Implement rural section on the north side of Clark Avenue from Sta. 28+00 to 93+00.** The original concept includes a 16 foot urban shoulder with curb and gutter and sidewalk. The proposed VE change is to a 10 foot rural shoulder with no curb and gutter and no sidewalk. The north side of Clark Avenue is undeveloped and has no current plans for development, thus sidewalk is not needed.

*Savings if implemented is \$486,000*

**C-3: Eliminate the 6 inch graded base extension under the curb and gutter.** A 12 inch thick GAB is included in the original design that extends 6 inches beyond the limit of curb and gutter. The proposal is to eliminate this 6 inch extension of material.

*Potential marginal savings is \$34,700*

**D-1: Use spillways in lieu of catch basins in areas with ditches.** Catch basins and piping is used in the area of School Street to North Mock Road in addition to an open ditch is provided for drainage. The proposed change is to use the ditch for drainage and delete the piping.

*Potential savings is \$75,100*

**D-2: Use roadside ditches / bioswales in lieu of detention ponds for stormwater detention.** It appears the existing ditches could be developed into oversized ditches / bioswales eliminating maintenance and liability associated with detention ponds.

*Potential savings is \$101,400*

**D-4: Use modified rural section in select areas.** This item suggests using a modified rural section in the area of School Street to North Mock Road eliminating the curb and gutter and closed drainage system. This is similar to D-1 except the curb and gutter is also eliminated.

*Savings potential is \$121,000*

**E-1: Reduce median width from 16 feet to 6 feet.** This idea proposes reducing the median width between intersections where left turns are required to 6 feet including a 2 foot raised median with 2 foot offsets on each side. This narrower median could be more appropriate in this urban roadway environment. This idea also includes eliminating the u-turn at Sta. 53+25 and shortening the left turn lane at Sta. 70+00.

*If implemented, savings could be on the order of \$510,000*

**G-1: Eliminate the sidewalk on the north side.** This concept places a cost on the sidewalk that runs on the north side of the project.

*Proposed savings is \$159,000*

**G-2: Use asphalt sidewalks in lieu of concrete.** This idea replaces the sidewalk material for the entire project and does not include any sidewalk quantity reductions. Proposed material works well in an urban environment. Repair is easier and less expensive and material is more flexible with tree root infringement.

*Savings could amount to \$263,000*

**G-4: Use alternate detail for under the bridge pier protection.** This idea proposes an alternative design concept for the pier protection in lieu of GDOT standard 4948. It proposes to install guardrail along the edge of the sidewalk. The existing design introduces constructability issues with compaction of fill against the existing piers and interface between the existing slope paving and new construction.

*Potential savings is \$111,000*

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**SUMMARY OF POTENTIAL COST SAVINGS**

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
<b>A</b>	<b>AC Pavement</b>						
A-1	Re-use existing pavement	1,501,000	375,000	1,126,000	-0-	1,126,000	1,126,000
A-2	Remove full depth pavement under the median	827,000	157,000	670,000	-0-	670,000	670,000
A-2.1	Reduce full depth pavement thickness under the median	488,000	311,000	177,000	-0-	177,000	-0-
A-4	Reduce depth of pavement section on ramp shoulder	69,500	26,500	43,000	-0-	43,000	43,000
A-7	Reduce depth of pavement section on Cordele Road	822,000	553,000	269,000	-0-	269,000	-0-
A-7.1	Implement mill and inlay on Cordele Road	822,000	153,000	669,000	-0-	669,000	669,000

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
<b>B</b>	<b>Right of Way</b>						
B-1	Narrow the shoulder to 12 feet	318,000	-0-	318,000	-0-	318,000	159,000
B-4	Shift Clark Ave. alignment north near water tower	273,000	-0-	273,000	-0-	273,000	273,000
B-6	Implement rural section on north side of Clark Ave. Sta. 28+00 to 93+00	604,000	118,000	486,000	-0-	486,000	486,000
<b>C</b>	<b>Aggregate Base</b>						
C-3	Eliminate the 6 inch graded base extension	34,700	-0-	34,700	-0-	34,700	34,700
<b>D</b>	<b>Storm Drainage</b>						
D-1	Use spillways in lieu of catch basins in areas of ditches	90,200	15,100	75,100	-0-	75,100	-0-
D-2	Use roadside ditches / bioswales in lieu of detention ponds	126,000	24,600	101,400	-0-	101,400	-0-
D-4	Use modified rural section in select area	121,000	-0-	121,000	-0-	121,000	-0-



## **STUDY IDENTIFICATION**

## Study Identification

<b>Project:</b> SR 300/SR 520 Clark Ave. and SR 3 Interchange Ramps Improvements	<b>Date:</b> November 1-4, 2010
<b>Location:</b> Dougherty County	

### VE Team Members

Name:	Title:	Organization:	Telephone:
George Obaranec	Construction	MACTEC	770-421-3346
Stephen Gaines	Highway Design	Wolverton Associates	770-447-8999
David Wohlscheid	VE Team Facilitator	MACTEC	571-217-0808

### Project Description

The current Clark Avenue road is a 4-lane section with a center turn lane and has an ADT of 22,600 vehicles per day (2008). It is also known as the Georgia-Florida Parkway and is a vital part of the metropolitan Albany transportation system. This section of roadway is functionally classified as an Urban Principal Arterial. The improvements are needed to alleviate congestion and reduce crash frequency. The proposed changes include reconstruction of the 1.20 mile section from an existing 5-lane urban section to a six lane urban section. The typical section would include three 11 foot travel lanes in each direction, a 16 foot raised median, and 16 foot shoulders including an 8-foot multi-use path on the south side and a 5-foot wide sidewalk on the north side of the roadway. For approaches from Cordele Road to Clark Road, two 12 foot wide left turn lanes on the northbound approach and one 12 foot right turn lane on the southbound approach are included. The updated (2012) AADT is 34,700 and the design year (2032) is 54,750. The posted speed limit is 45 mph.

The estimated project cost for this project is \$14,123,000 including construction cost of \$9,717,000, right of way of \$3,163,000, utilities of \$131,000, fuel and AC adjustments of \$629,000 and E&I of \$483,000. The cost model shown later in this section of \$13,494,000 does not include fuel and AC adjustments. No cost has been included for contingencies.

The second 0.65 mile project, the intersection improvement project, is needed because the southbound and northbound ramps to the SR 3 from Clark Avenue currently function at unacceptable levels during peak hours. For the SR 3 southbound ramps, the proposed project adds two 12 foot wide exit lanes with the existing 12 foot wide entrance lane separated by an 11 foot wide raised median; 12 foot wide shoulders (8 feet paved, 4 feet grassed). The right turn lane to the southbound entrance ramp will be extended.

The SR 3 northbound ramps will have two 12 foot wide exit lanes added and one 12 foot wide entrance lane added, separated by an 11 foot wide raised median; 12 foot wide shoulders (8 feet paved, 4 feet grassed).

The project cost for this project is estimated to be \$5,589,000, including construction cost of \$3,765,000, right of way of \$1,276,000, utilities of \$100,000, fuel and AC adjustments of \$260,000 and E&I of \$188,000. The cost model shown as \$5,329,000 does not include fuel and AC adjustments. No cost has been included for contingencies.

The study took place November 1-4, 2010, at the Georgia DOT General Office in Atlanta using a three person VE team. It was conducted at the preliminary design level design of these capacity and safety related improvements.

### **Project Constraints:**

The only constraints placed upon the VE team are shown below:

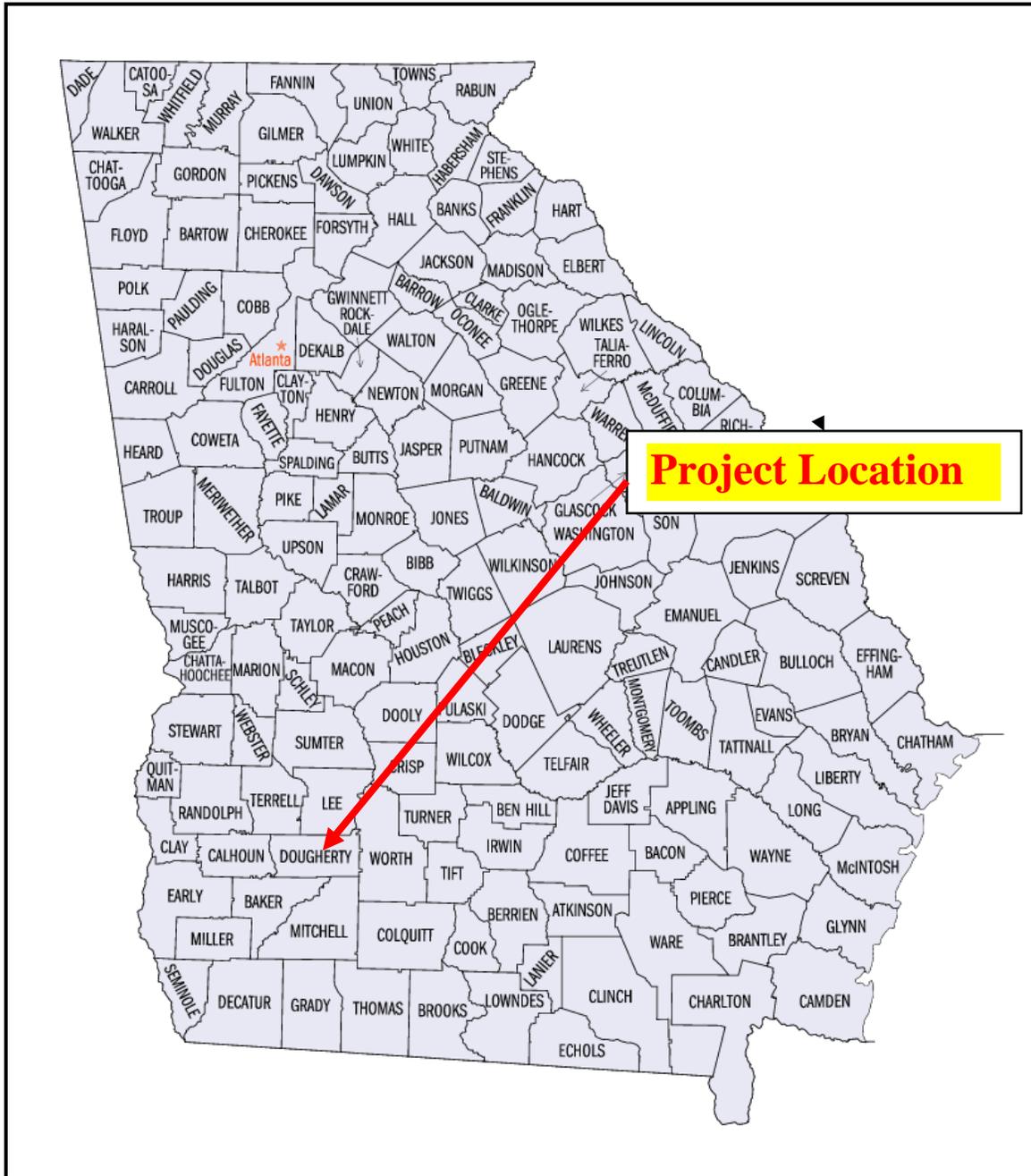
- There is a water tower on the north side of this project at Sta. 55+00 LT that should be avoided due to cost to relocate.
- Maintain no impacts to the historic apartments on the south side of Clark at Sta. 28+88 RT to 36+48 RT.
- A substandard skew angle between Cordele Road and Clark Avenue will be retained due to cost (see design exception).
- There will be no adjustment to the SR 3 /Liberty Expressway Bridge. A substandard radius is proposed (see design exception).
- Bike lanes have been removed from the project.

### **Project Briefing:**

The VE team was given a design briefing on the current status of the project by Rishee Shah and Albert Shelby from the office of Roadway Design and program delivery, respectively. In addition to the above constraints, the following items were discussed:

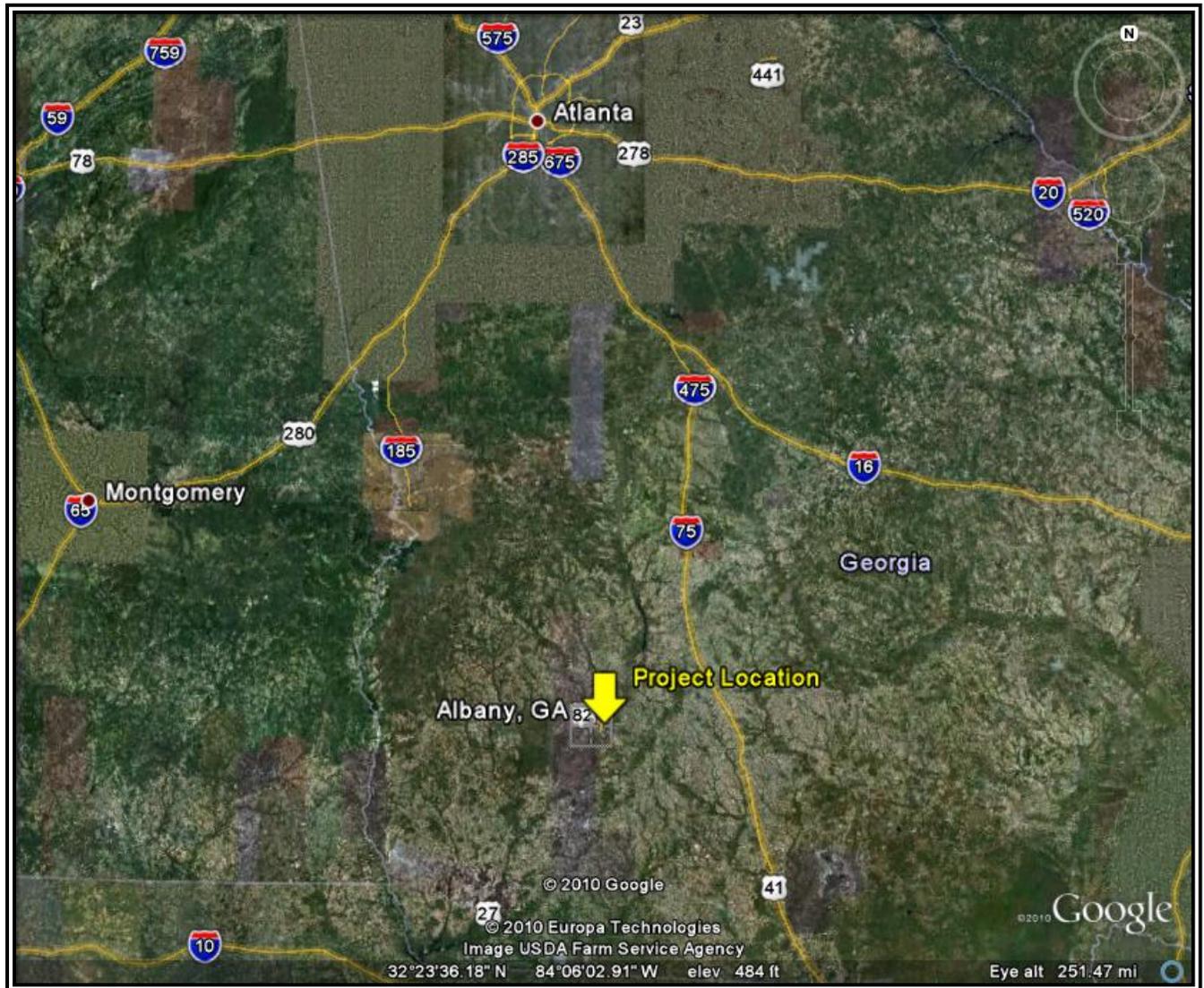
- The current letting date for this project is fiscal 2016.
- No right of way has been purchased to date, but is scheduled to begin in 2013.
- The Environmental Document has not been approved.
- There are no ecological or historic impacts, however there are historic apartments in the area that need to be avoided.
- No wetland mitigation is required for this project, nor are there any archaeological or cemetery impacts.
- The area is part of a County bike plan but not the state bike plan.

**Figure 1  
Project Vicinity Map**



**County Map of Georgia**

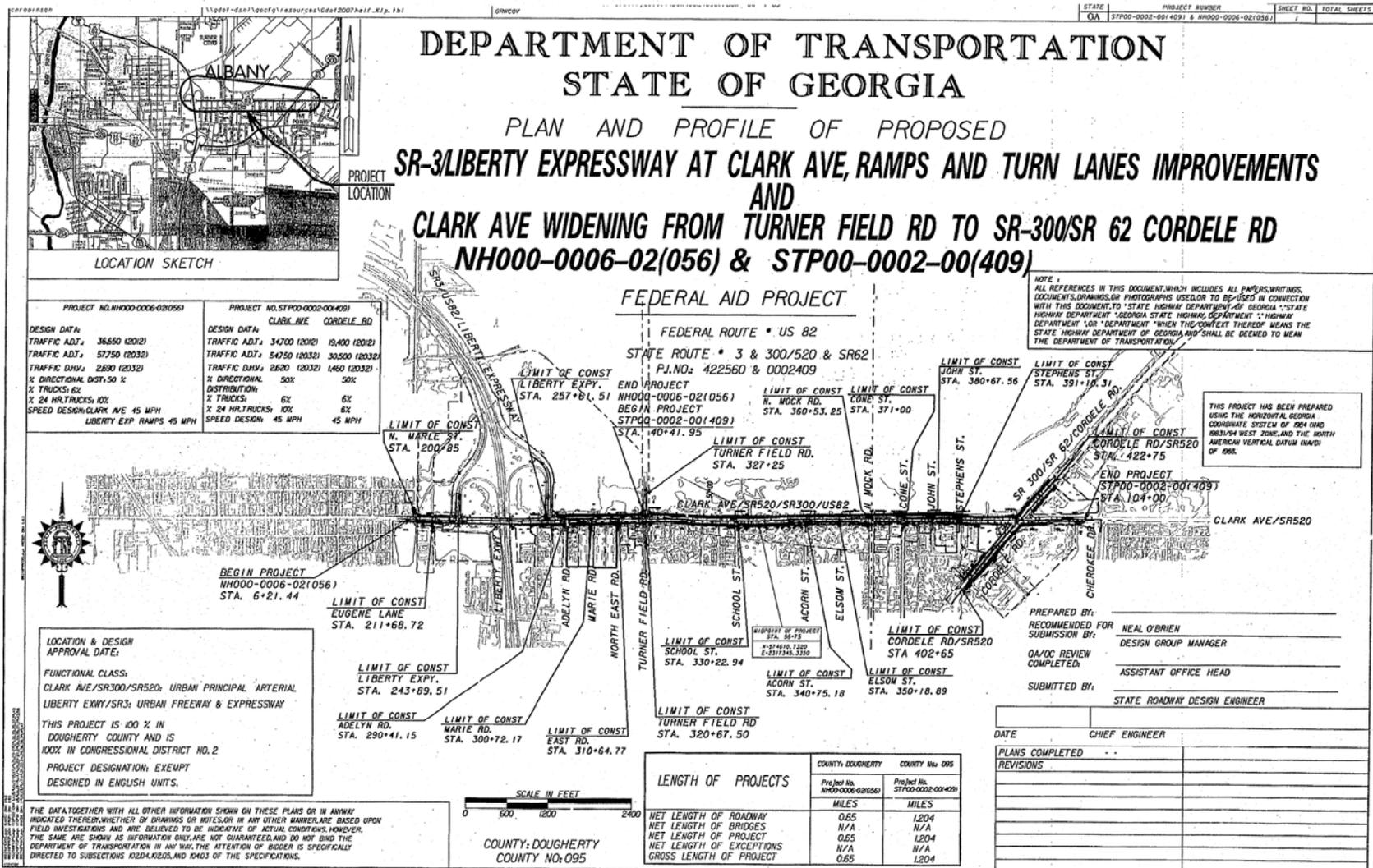
Figure 2  
Project Vicinity



**Figure 3**  
**Project Limits**



Figure 4  
Project Plan



**Figure 5  
Typical Section**

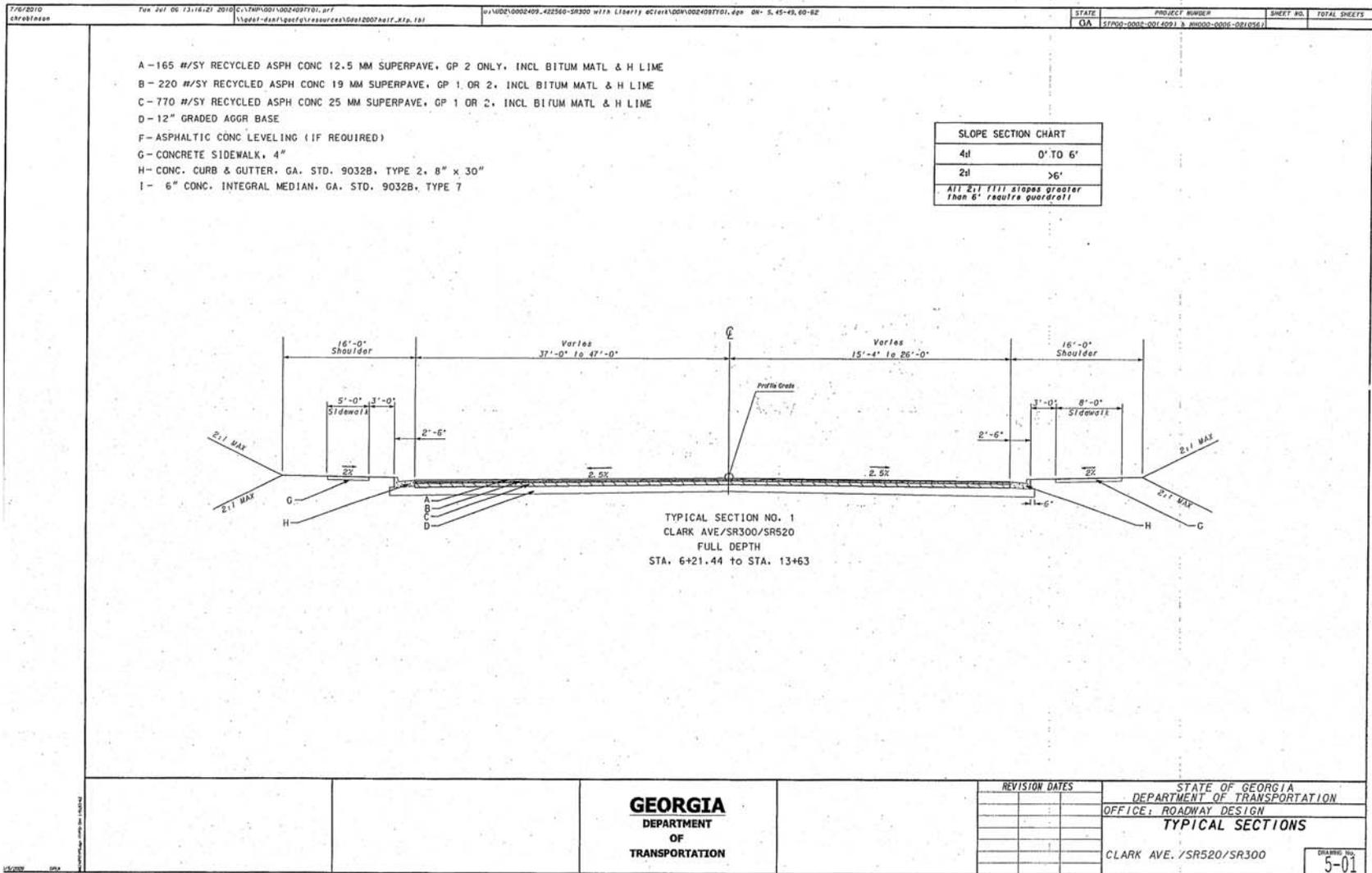
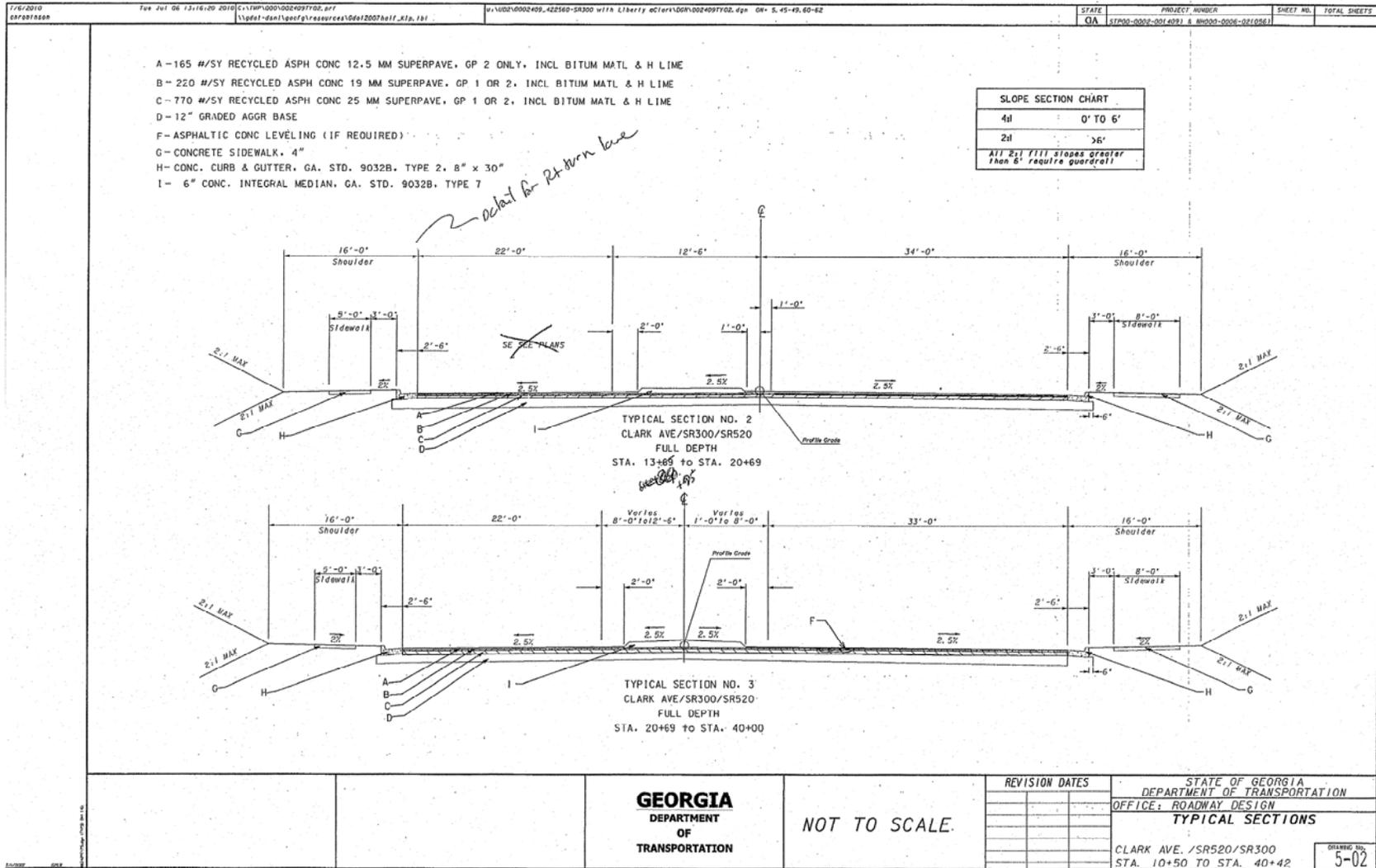


Figure 6  
Typical Sections



REVISION DATES

STATE OF GEORGIA  
DEPARTMENT OF TRANSPORTATION  
OFFICE: ROADWAY DESIGN  
**TYPICAL SECTIONS**  
CLARK AVE./SR520/SR300  
STA. 10+50 TO STA. 40+42

DRAWING NO.  
5-02

**Figure 7  
Typical Sections**

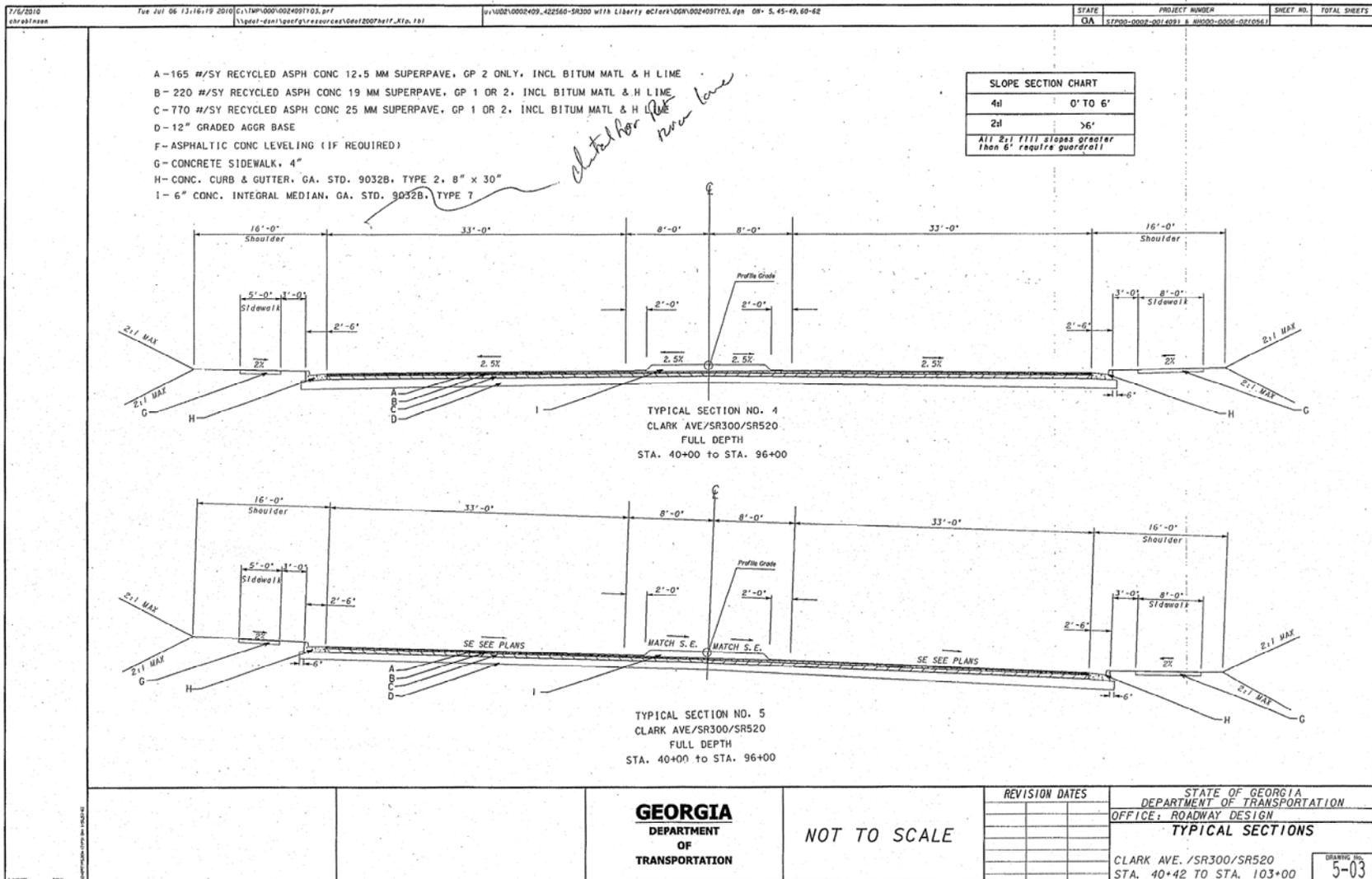


Figure 8  
Typical Sections

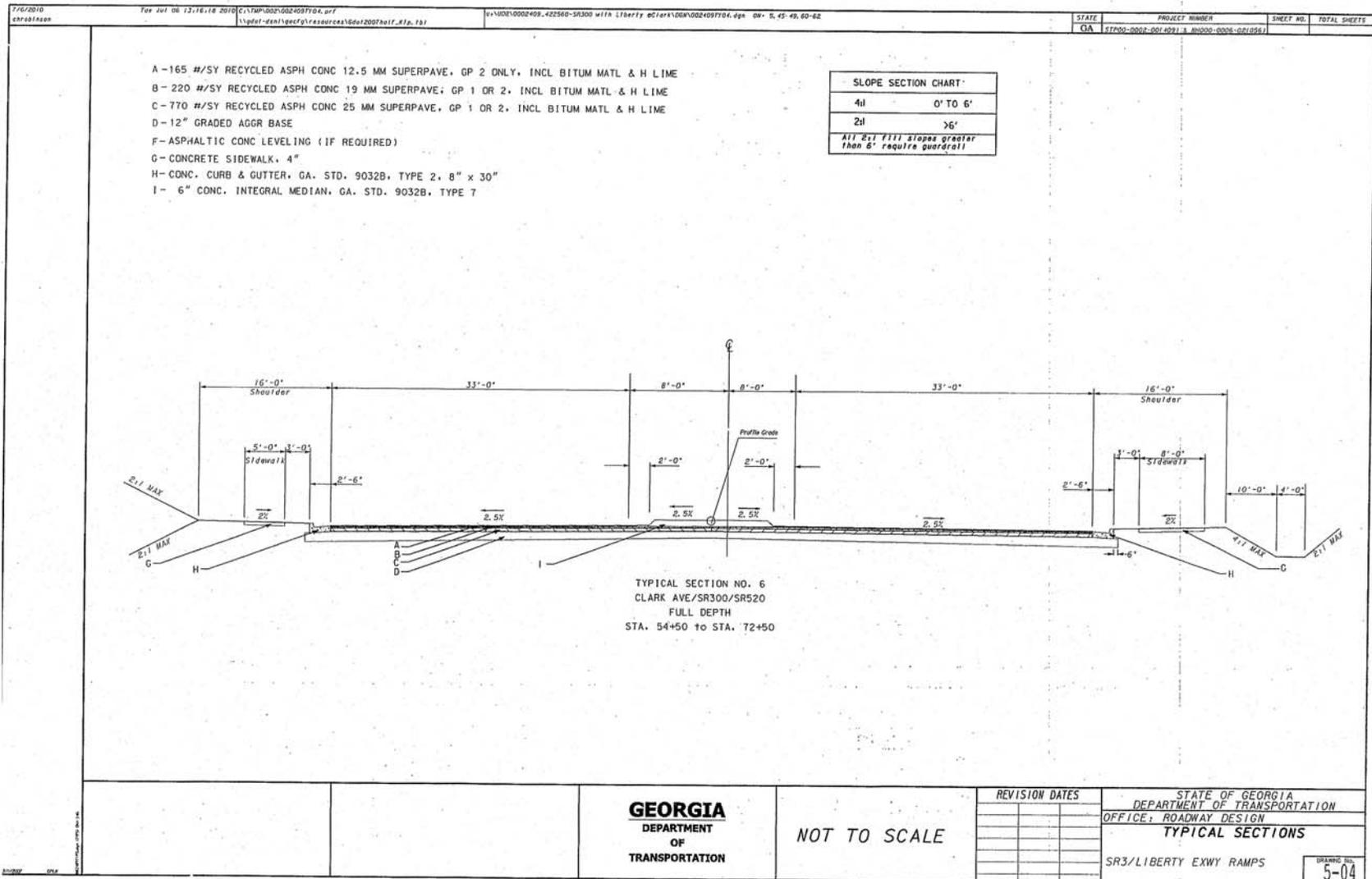


Figure 9  
Typical Sections

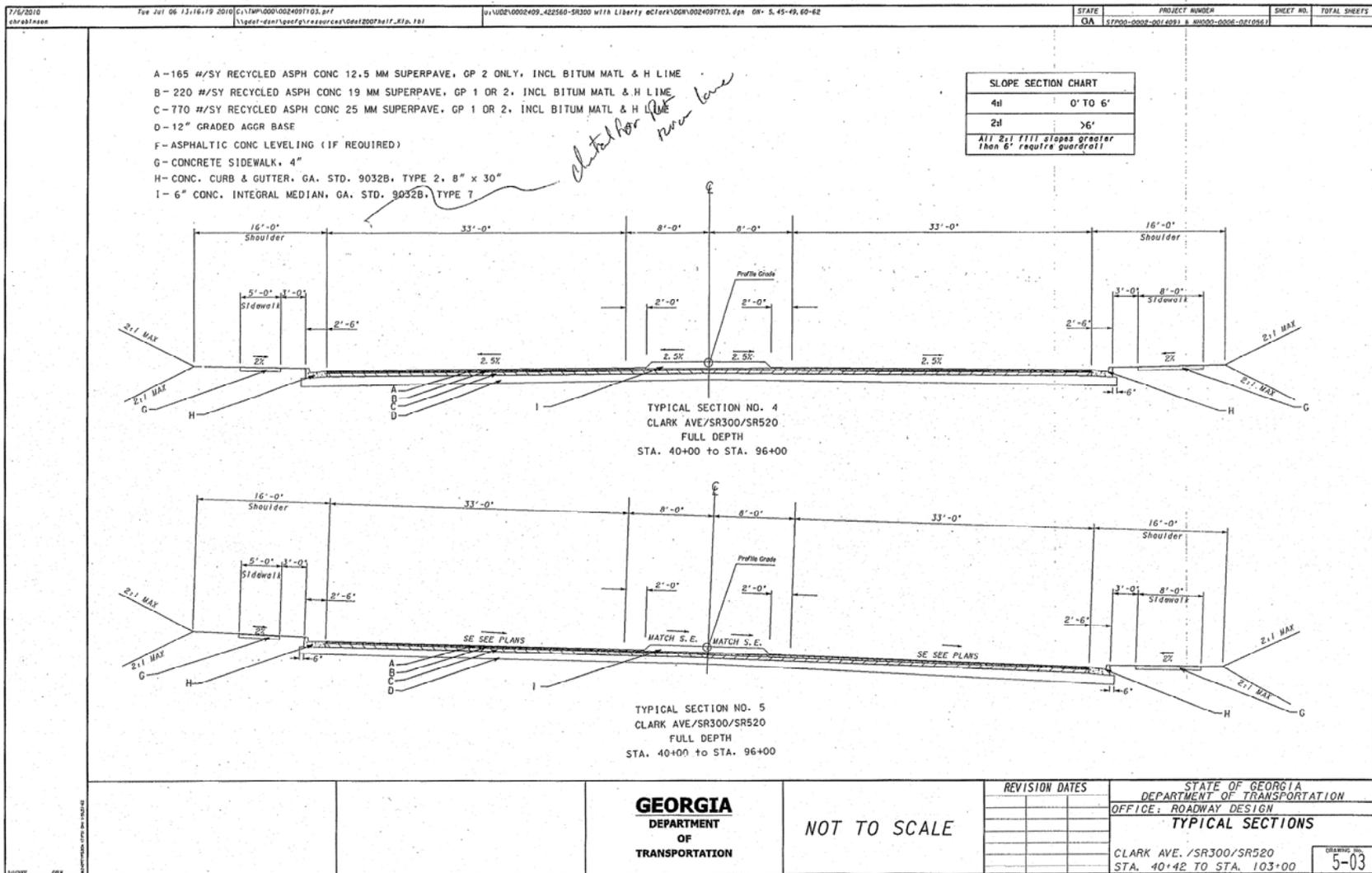


Figure 10  
Typical Sections

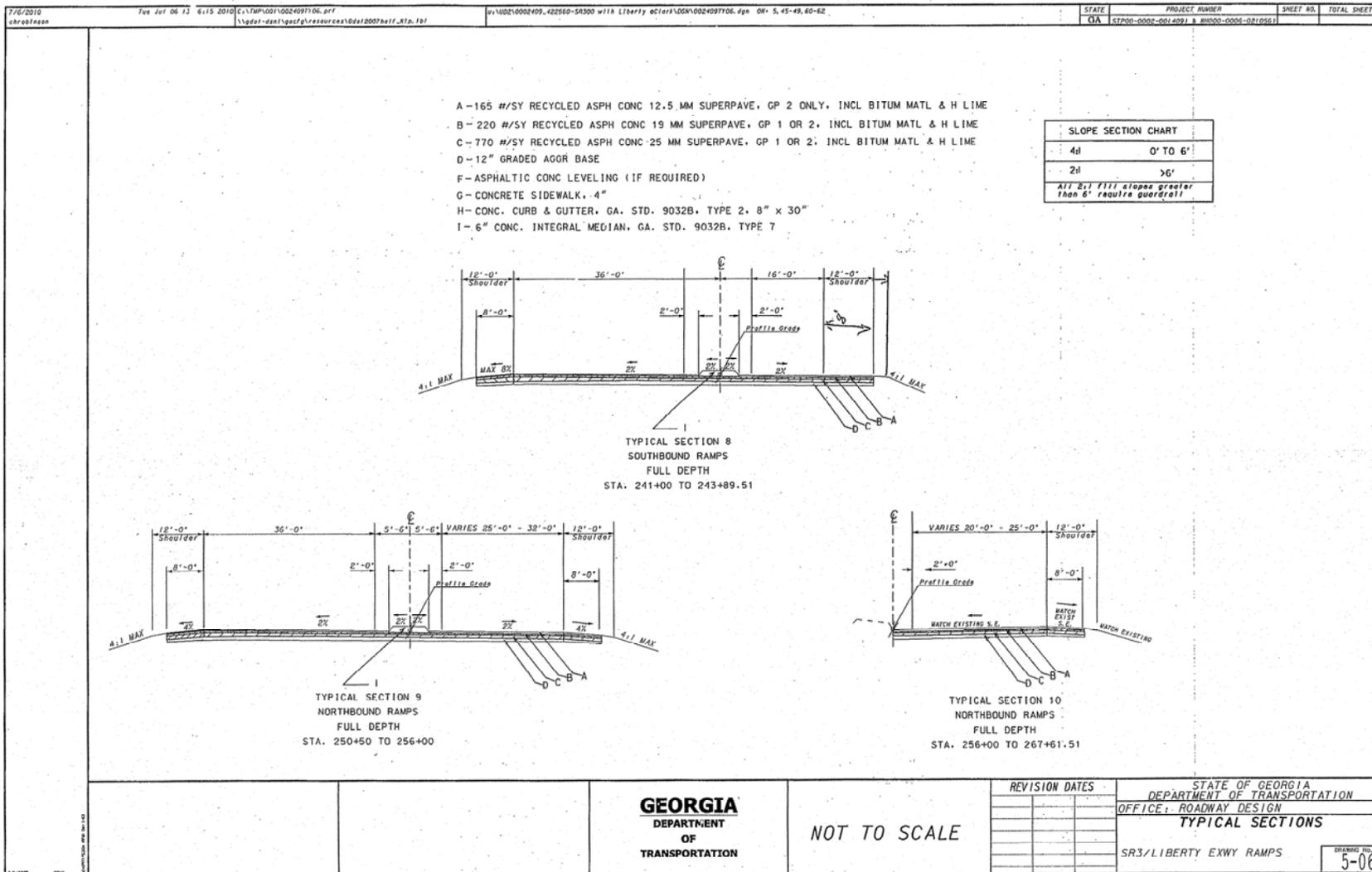


Figure 11  
Typical Sections

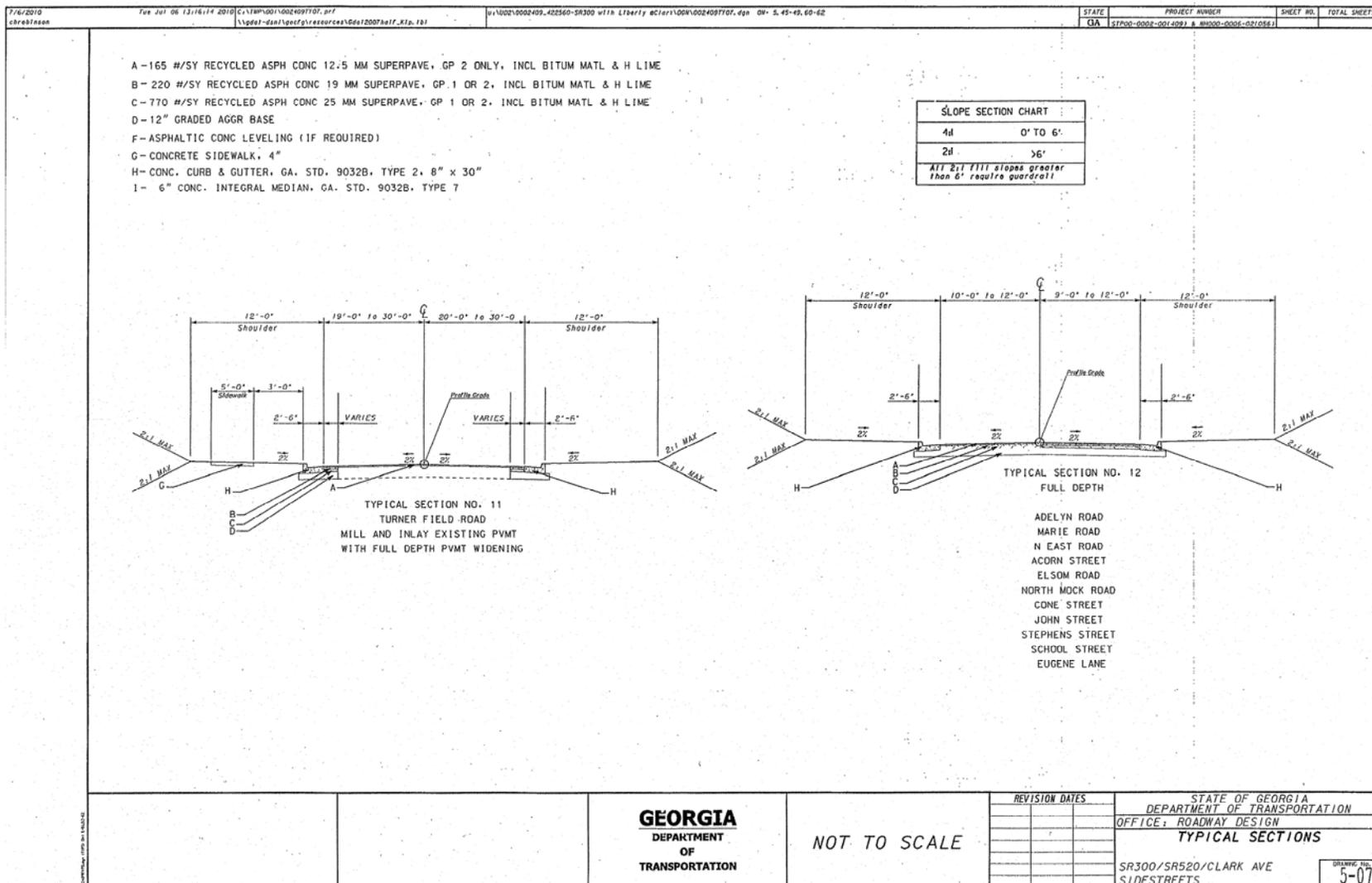
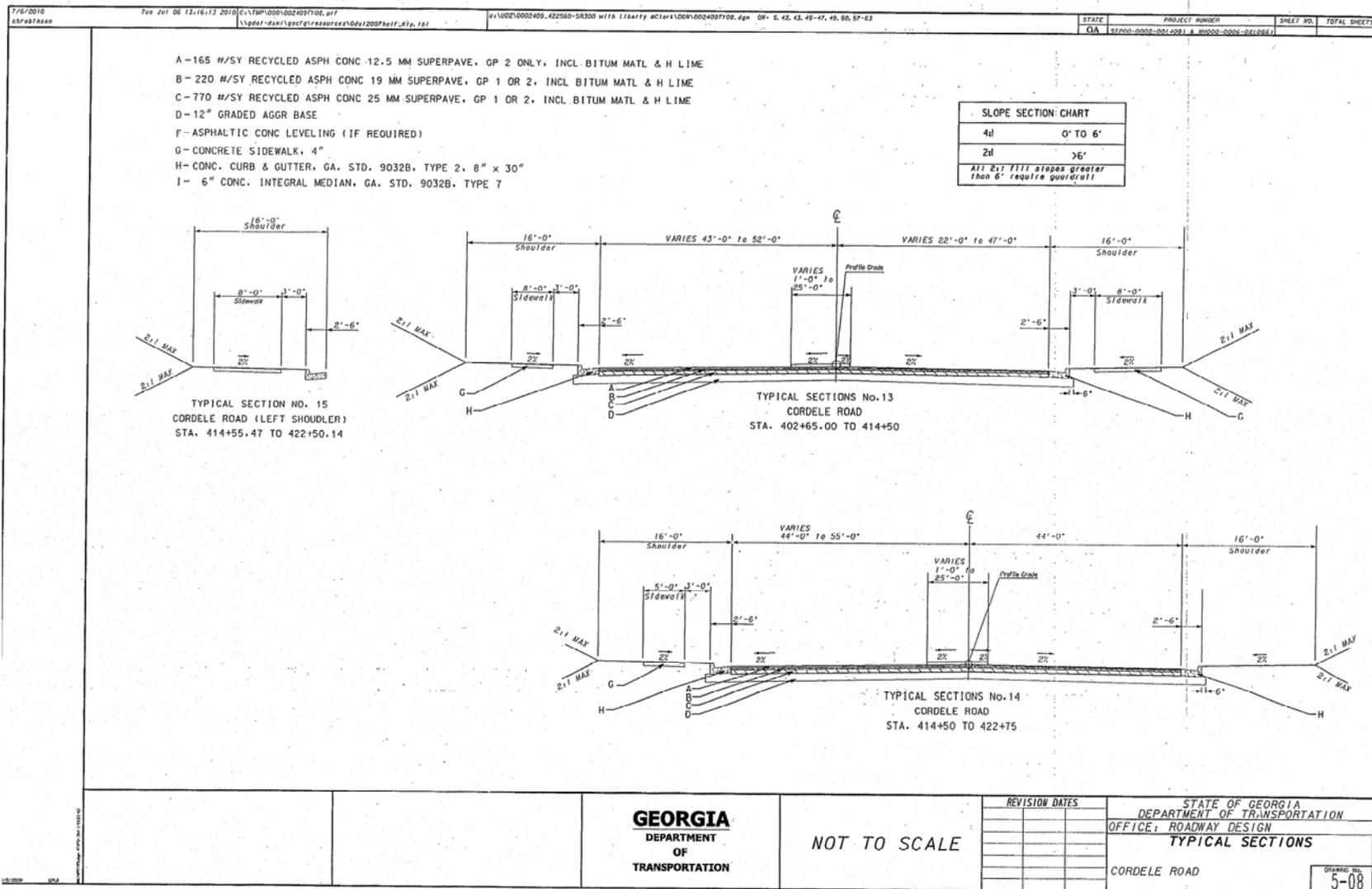


Figure 12  
Typical Sections



# Cost Estimate Summary Sheets

STATE HIGHWAY AGENCY  
 DATE : 10/14/2010  
 PAGE : 1  
 JOB DETAIL ESTIMATE

JOB NUMBER : 0002409-01      SPEC YEAR: 01  
 DESCRIPTION: SR 300 WIDENING - DOUGHERTY COUNTY  
 ITEMS FOR JOB 0002409-01

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
<b>ROADWAY ITEM</b>							
0005	109-0100		*\$*	PRICE ADJ - UNLEADED FUEL	1.000	131534.41	131534.41
0010	109-0200		*\$*	PRICE ADJ - DIESEL FUEL	1.000	469815.85	469815.85
0015	109-0300		*\$*	PRICE ADJ - ASPHALT CEMENT	1.000	27755.14	27755.14
0020	150-1000		LS	TRAFFIC CONTROL - STP00-0002-00(409)	1.000	101694.26	101694.26
0025	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	90000.00	90000.00
0030	210-0100		LS	GRADING COMPLETE - STP00-002-00(409)	1.000	459000.00	459000.00
0035	310-5060		SY	GR AGGR BS CRS 6IN INCL MATL	165.000	8.12	1340.51
0040	310-5080		SY	GR AGGR BS CRS 8IN INCL MATL	4894.000	11.47	56173.19
0045	310-5120		SY	GR AGGR BS CRS 12IN INCL MATL	83818.000	30.47	2554014.93
0050	318-3000		TN	AGGR SURF CRS	150.000	19.25	2887.89
0055	402-1812		TN	RECYL AC LEVELING, INC BM&HL	53.000	85.47	4530.26
0060	402-3130		TN	RECYL AC 12.5MM SP, GP2, BM&HL	7807.000	74.17	579059.71
0065	402-3121		TN	RECYL AC 25MM SP, GP1/2, BM&HL	24392.000	71.14	1735317.37
0070	402-3190		TN	RECYL AC 19 MM SP, GP 1 OR 2 , INC BM&HL	10170.000	73.88	751452.05
0075	407-0010		LF	ASPH-RUB JOINT/CRACK SEAL TP M	1066.000	13.19	14063.29
0080	413-1000		GL	BITUM TACK COAT	10923.000	2.23	24385.27
0085	432-0206		SY	MILL ASPH CONC PVMT/ 1.50" DEP	2181.000	4.12	8998.04
0090	432-5010		SY	MILL ASPH CONC PVMT, VARB DEPTH	1307.000	8.86	11584.74
0095	441-0018		SY	DRIVEWAY CONCRETE, 8 IN TK	706.000	51.45	36326.54
0100	441-0104		SY	CONC SIDEWALK, 4 IN	9665.000	38.76	374624.29
0105	441-0748		SY	CONC MEDIAN, 6 IN	878.000	36.69	32216.23
0110	441-0754		SY	CONC MEDIAN, 7 1/2 IN	7024.000	75.97	533661.39
0115	441-4030		SY	CONC VALLEY GUTTER, 8 IN	226.000	53.36	12060.74
0120	441-5002		LF	CONC HEADER CURB, 6", TP 2	500.000	22.75	11378.25
0125	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	16005.000	16.05	256902.98
0130	446-1100		LF	PVMT REF FAB STRIPS, TP2, 18 INCH WIDTH	1303.000	10.64	13868.18
0135	500-3200		CY	CL B CONC	4.000	784.73	3138.93
0140	500-9999		CY	CL B CONC, BASE OR PVMT WIDEN	29.000	199.75	5792.75
0145	632-0003		EA	CHANGEABLE MESS SIGN, PORT, TP 3	2.000	16305.18	32610.38
0150	634-1200		EA	RIGHT OF WAY MARKERS	45.000	101.09	4549.16
0153	643-1152		LF	CH LK FEN, ZC COAT, 6', 9 GA	1255.000	31.69	39773.95
0154	643-8010		EA	GATE, CHAIN LINK ZC COAT - CLARK AVENUE	1.000	802.24	802.24
<b>DRAINAGE</b>							
0155	550-1180		LF	STM DR PIPE 18", H 1-10	7809.000	44.41	346828.07
0160	550-1240		LF	STM DR PIPE 24", H 1-10	3266.000	61.88	202124.25
0165	550-1300		LF	STM DR PIPE 30", H 1-10	2467.000	58.72	144884.96
0170	550-1301		LF	STM DR PIPE 30", H 10-15	46.000	87.21	4011.83
0175	550-1360		LF	STM DR PIPE 36", H 1-10	92.000	104.95	9655.79
0180	550-1361		LF	STM DR PIPE 36", H 10-15	269.000	60.71	16332.39
0185	550-1420		LF	STM DR PIPE 42", H 1-10	1527.000	66.69	101844.50
0190	550-1480		LF	STM DR PIPE 48", H 1-10	186.000	142.13	26436.22
0195	550-2300		LF	SIDE DR PIPE 30", H 1-10	162.000	55.04	8917.45
0200	550-3418		EA	SAFETY END SECTION 18", SD, 4:1	12.000	581.81	6981.75
0205	611-8050		EA	ADJUST MANHOLE TO GRADE	1.000	1273.68	1273.69
0210	668-1100		EA	CATCH BASIN, GP 1	110.000	2188.48	240733.31
0215	668-1110		LF	CATCH BASIN, GP 1, ADDL DEPTH	31.000	262.63	8141.78



0220	668-1200	EA	CATCH BASIN, GP 2	10.000	3055.25	30552.50
0225	668-1210	LF	CATCH BASIN, GP 2, ADDL DEPTH	34.000	312.47	10624.06
0230	668-2100	EA	DROP INLET, GP 1	13.000	2666.03	34658.40
0235	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	11.000	252.26	2774.95
0240	441-0303	EA	CONC SPILLWAY, TP 3	1.000	2232.72	2232.72
<b>EROSION CONTROL ITEMS-PERMANENT</b>						
0245	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	6.000	44.34	266.05
0249	603-7000	SY	PLASTIC FILTER FABRIC	6.000	5.41	32.49
0250	700-6910	AC	PERMANENT GRASSING	13.000	943.47	12265.11
0255	700-7000	TN	AGRICULTURAL LIME	39.000	80.75	3149.28
0260	700-7010	GL	LIQUID LIME	32.000	23.77	760.75
0265	700-8000	TN	FERTILIZER MIXED GRADE	13.000	353.90	4600.77
0270	700-8100	LB	FERTILIZER NITROGEN CONTENT	637.000	2.87	1832.46
<b>EROSION CONTROL ITEMS-TEMPORARY</b>						
0275	163-0232	AC	TEMPORARY GRASSING	7.000	593.89	4157.28
0280	163-0240	TN	MULCH	357.000	240.74	85945.91
0285	163-0300	EA	CONSTRUCTION EXIT	18.000	1865.34	33576.17
0290	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	118.000	366.71	43271.81
0295	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	11112.000	0.93	10444.17
0299	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	7.000	157.63	1103.41
0300	165-0101	EA	MAINT OF CONST EXIT	18.000	608.13	10946.40
0305	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	118.000	85.52	10091.76
0315	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	1640.62	3281.24
0320	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	1282.79	30787.10
0334	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	22224.000	1.85	41205.74
<b>SIGNAL ITEMS</b>						
0335	647-1000	LS	TRAF SIGNAL INSTALLATION NO - TURNER FIELD RD	1.000	80000.00	80000.00
0340	647-1000	LS	TRAF SIGNAL INSTALLATION NO - CORDELE RD	1.000	80000.00	80000.00
0345	647-1000	LS	TRAF SIGNAL INSTALLATION NO - MOCK RD	1.000	80000.00	80000.00
<b>SIGNING AND MARKING ITEMS</b>						
0350	636-1020	SF	HWY SGN, TP1MAT, REFL SH TP3	82.000	18.67	1531.12
0355	636-1029	SF	HWY SGN, TP2 MATL, REFL SH TP 3	5.000	14.96	74.84
0360	636-1041	SF	HWY SIGNS, TP 2MAT, REFL SH TP 9	114.000	24.92	2841.05
0365	636-2070	LF	GALV STEEL POSTS, TP 7	232.000	9.06	2102.74
0370	636-2090	LF	GALV STEEL POSTS, TP 9	74.000	10.02	741.90
0374	639-3004	EA	STEEL STRAIN POLE, TP IV	12.000	10246.40	122956.89
0375	639-4003	EA	STRAIN POLE, TP III	5.000	6066.74	30333.70
0380	652-2501	LM	SOLID TRAF STRIPE, 5 IN, WHITE	4.000	372.18	1488.73
0385	652-2502	LM	SOLID TRAF STRIPE, 5 IN, YELLO	6.000	361.89	2171.37
0390	652-3501	GLM	SKIP TRAF STRIPE, 5 IN, WHITE	5.000	335.06	1675.33
0405	652-5701	LF	SOLID TRAF STRIPE, 24", WHITE	1350.000	0.94	1273.33
0410	652-6501	GLF	SKIP TRAF STRIPE, 5 IN, WHITE	2050.000	0.11	243.52
0415	652-9001	SY	TRAFFIC STRIPE, WHITE	425.000	2.06	875.95
0420	652-9002	SY	TRAFFIC STRIPE, YELLOW	1100.000	1.00	1105.81
0425	653-0120	EA	THERM PVMT MARK, ARROW, TP 2	52.000	75.35	3918.23
0430	653-0210	EA	THERM PVMT MARK, WORD, TP 1	10.000	112.84	1128.45

ITEM TOTAL  
 INFLATED ITEM TOTAL  
 ENGINEERING AND INSPECTION (5%):  
 CONTINGENCY (0.00):  
 ESTIMATED TOTAL:

*w/o Fuel Adjustments & (C&D ASPH Cement)*  
 9,663,397  
 483,170  


---

 10,146,567  
*SAY 10,200,000*  
 10,292,502.38  
 10,292,502.38  
 514,625.12  
 0.00  
 10,807,127.50 (USE 10,900,000.00)

DATE : 10/12/2010  
 PAGE : 1

STATE HIGHWAY AGENCY

JOB DETAIL ESTIMATE

JOB NUMBER : 422560-01      SPEC YEAR: 01  
 DESCRIPTION: SR 300 WIDENINIG - DOUGHERTY COUNTY

ITEMS FOR JOB 422560-01

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
<b>ROADWAY ITEMS</b>							
0002	109-0100		*\$*	PRICE ADJ - UNLEADED FUEL	1.000	54734.77	54734.77
0003	109-0200		*\$*	PRICE ADJ - DIESEL FUEL	1.000	193963.94	193963.94
0004	109-0300		*\$*	PRICE ADJ - ASPHALT CEMENT	1.000	11368.35	11368.35
0005	150-1000		LS	TRAFFIC CONTROL - NH000-0006-02(056)	1.000	95000.00	95000.00
0010	210-0100		LS	GRADING COMPLETE - NH000-0006-02(056)	1.000	175000.00	175000.00
0015	310-5120		SY	GR AGGR BS CRS 12IN INCL MATL	37279.000	21.28	793427.97
0020	402-3130		TN	RECYL AC 12.5MM SP,GP2,BM&HL	3076.000	71.36	219526.61
0025	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	10252.000	63.39	649892.94
0030	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	4101.000	63.28	259521.78
0035	413-1000		GL	BITUM TACK COAT	4474.000	2.22	9953.76
0040	432-5010		SY	MILL ASPH CONC PVMT,VARB DEPTH	609.000	8.62	5250.38
0045	318-3000		TN	AGGR SURF CRS	28.000	25.55	715.54
0049	441-0006		SY	CONC SLOPE PAV, 6 IN	403.000	54.99	22163.38
0050	441-0104		SY	CONC SIDEWALK, 4 IN	4179.000	46.15	192864.40
0055	441-0748		SY	CONC MEDIAN, 6 IN	376.000	50.73	19077.62
0060	441-0754		SY	CONC MEDIAN, 7 1/2 IN	2280.000	59.67	136061.67
0065	441-4030		SY	CONC VALLEY GUTTER, 8 IN	57.000	53.36	3041.87
0075	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	6350.000	16.05	101917.50
0080	446-1100		LF	PVMT REF FAB STRIPS, TP2,18 INCH WIDTH	1303.000	6.10	7957.47
0085	500-3200		CY	CL B CONC	1.000	421.62	421.62
0114	621-4061		LF	CONCRETE SIDE BARRIER, TY 6A	279.000	375.00	104625.00
0115	632-0003		EA	CHANGEABLE MESS SIGN,PORT,TP 3	2.000	15488.19	30976.38
0209	641-1200		LF	GUARDRAIL, TP W	2080.000	16.98	35328.11
0215	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	4.000	653.51	2614.05
0220	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	4.000	2021.24	8085.00
0225	643-8010		EA	GATE, CHAIN LINK ZC COAT - CLARK AVENUE	1.000	784.72	784.72
0229	643-1152		LF	CH LK FEN, ZC COAT, 6', 9 GA	790.000	27.06	21382.57
0230	643-1171		LF	CH LK FEN, ZC COAT, 8', 9 GA	790.000	42.20	33338.00
0239	643-8200		LF	BARRIER FENCE (ORANGE), 4 FT	674.000	4.31	2905.22
<b>DRAINAGE ITEMS</b>							
0244	550-1180		LF	STM DR PIPE 18",H 1-10	1862.000	37.86	70503.35
0245	550-1181		LF	STM DR PIPE 18",H 10-15	88.000	49.76	4379.07
0250	550-1240		LF	STM DR PIPE 24",H 1-10	775.000	46.30	35886.35
0255	550-1241		LF	STM DR PIPE 24",H 10-15	218.000	41.39	9024.59
0260	550-1300		LF	STM DR PIPE 30",H 1-10	1212.000	58.43	70824.82
0265	550-1301		LF	STM DR PIPE 30",H 10-15	300.000	58.34	17503.13
0270	550-4218		EA	FLARED END SECT 18 IN, ST DR	1.000	730.04	730.04
0279	550-4224		EA	FLARED END SECT 24 IN, ST DR	2.000	719.81	1439.64
0280	550-4230		EA	FLARED END SECT 30 IN, ST DR	1.000	894.84	894.85
0295	668-1100		EA	CATCH BASIN, GP 1	41.000	2574.02	105535.21
0300	668-1110		LF	CATCH BASIN, GP 1, ADDL DEPTH	79.000	262.63	20748.41
0305	668-2100		EA	DROP INLET, GP 1	10.000	2252.52	22525.23
0309	668-2110		LF	DROP INLET, GP 1, ADDL DEPTH	9.000	276.86	2491.81

STATE HIGHWAY AGENCY

JOB DETAIL ESTIMATE

EROSION CONTROL ITEMS-PERMANENT						
0310	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	114.000	58.10	6623.56
0313	603-2018	SY	STN DUMPED RIP RAP, TP 1, 18"	252.000	45.71	11520.05
0314	603-7000	SY	PLASTIC FILTER FABRIC	366.000	6.02	2206.53
0315	700-6910	AC	PERMANENT GRASSING	6.000	1105.42	6632.57
0320	700-7000	TN	AGRICULTURAL LIME	16.000	56.32	901.23
0325	700-7010	GL	LIQUID LIME	13.000	19.81	257.65
0330	700-8000	TN	FERTILIZER MIXED GRADE	6.000	389.44	2336.70
0335	700-8100	LB	FERTILIZER NITROGEN CONTENT	252.000	2.95	743.60
EROSION CONTROL ITEMS-TEMPORARY						
0340	163-0232	AC	TEMPORARY GRASSING	3.000	839.60	2518.81
0345	163-0240	TN	MULCH	150.000	324.26	48639.44
0350	163-0300	EA	CONSTRUCTION EXIT	7.000	1805.51	12638.62
0355	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	51.000	199.75	10187.40
0360	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	3635.000	1.66	6058.38
0365	165-0101	EA	MAINT OF CONST EXIT	7.000	608.13	4256.93
0370	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	51.000	92.26	4705.42
0374	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	1099.04	2198.09
0375	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	1469.22	35261.47
0380	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	7269.000	2.75	19992.44
SIGNAL ITEMS						
0385	647-1000	LS	TRAF SIGNAL INSTALLATION NO - NB RAMP	1.000	80000.00	80000.00
0390	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SB RAMP	1.000	80000.00	80000.00
SIGNING AND MARKING ITEMS						
0395	636-1020	SF	HWY SGN, TP1MAT, REFL SH TP3	23.000	19.65	451.99
0400	636-1029	SF	HWY SGN, TP2 MATL, REFL SH TP 3	84.000	13.94	1171.29
0405	636-1041	SF	HWY SIGNS, TP 2MAT, REFL SH TP 9	114.000	22.18	2529.30
0410	636-2070	LF	GALV STEEL POSTS, TP 7	189.000	9.80	1852.35
0415	636-2080	LF	GALV STEEL POSTS, TP 8	24.000	11.32	271.86
0419	639-4003	EA	STRAIN POLE, TP III	10.000	6416.19	64161.90
0420	639-3004	EA	STEEL STRAIN POLE, TP IV	8.000	7051.97	56415.81
0425	652-2501	LM	SOLID TRAF STRIPE, 5 IN, WHITE	3.000	373.86	1121.61
0430	652-2502	LM	SOLID TRAF STRIPE, 5 IN, YELLO	3.000	348.74	1046.24
0435	652-6501	GLF	SKIP TRAF STRIPE, 5 IN, WHITE	2050.000	0.14	298.40
0440	652-5701	LF	SOLID TRAF STRIPE, 24", WHITE	650.000	0.89	582.18
0445	652-5801	LF	SOLID TRAF STRIPE, 8 IN, WHITE	1015.000	0.83	849.86
0450	652-9001	SY	TRAFFIC STRIPE, WHITE	200.000	2.00	400.65
0455	652-9002	SY	TRAFFIC STRIPE, YELLOW	420.000	1.15	483.93
0460	653-0120	EA	THERM PVMT MARK, ARROW, TP 2	2.000	85.58	171.16
0465	653-0170	EA	THERM PVMT MARK, ARROW, TP 7	7.000	111.21	778.54

ITEM TOTAL  
 INFLATED ITEM TOTAL  
 ENGINEERING AND INSPECTION (5%):  
 CONTINGENCY (0.00):  
 ESTIMATED TOTAL:

W/O FUEL + ASPH. Cement Adj.: 3,764,586  
 188,229  
 3,952,815  
 SAY 3,953,000

4,024,653.05  
 4,024,653.05  
 201,232.65  
 0.00  
 4,225,885.70 (4,226,000.00)

## **VE RECOMMENDATIONS**

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-1	1 of 4	Re-use existing pavement
Comp By: GAO		Date: 11/3/10
		Checked By: DCW
		Date: 11/3/10

**Original Concept:**

Totally remove and reconstruct full depth pavement for the entire project. The proposed pavement is 10.5 inches of asphalt over 12 inches of graded aggregate base.

**Proposed Change:**

Rather than full depth pavement reconstruction, rehabilitate and resurface the existing pavement, where feasible. Based on the roadway widening and the non-symmetrical alignment, this will only apply to the 33 foot wide, EB lanes. This idea was based on the concept of re-using the existing pavement, which was recommended by the District during the kickoff presentation.

**Justification:**

The draft pavement evaluation calls for total pavement removal and full depth reconstruction throughout the project. If, however, the final report allows for rehabilitation and resurfacing, there could potentially be some savings, although only a 33-foot wide area for the EB lanes would be suitable for re-use. Most of the widening is to the north, where only a narrow, 3 - 5 foot section of roadway will remain. This width is not sufficient for re-use.

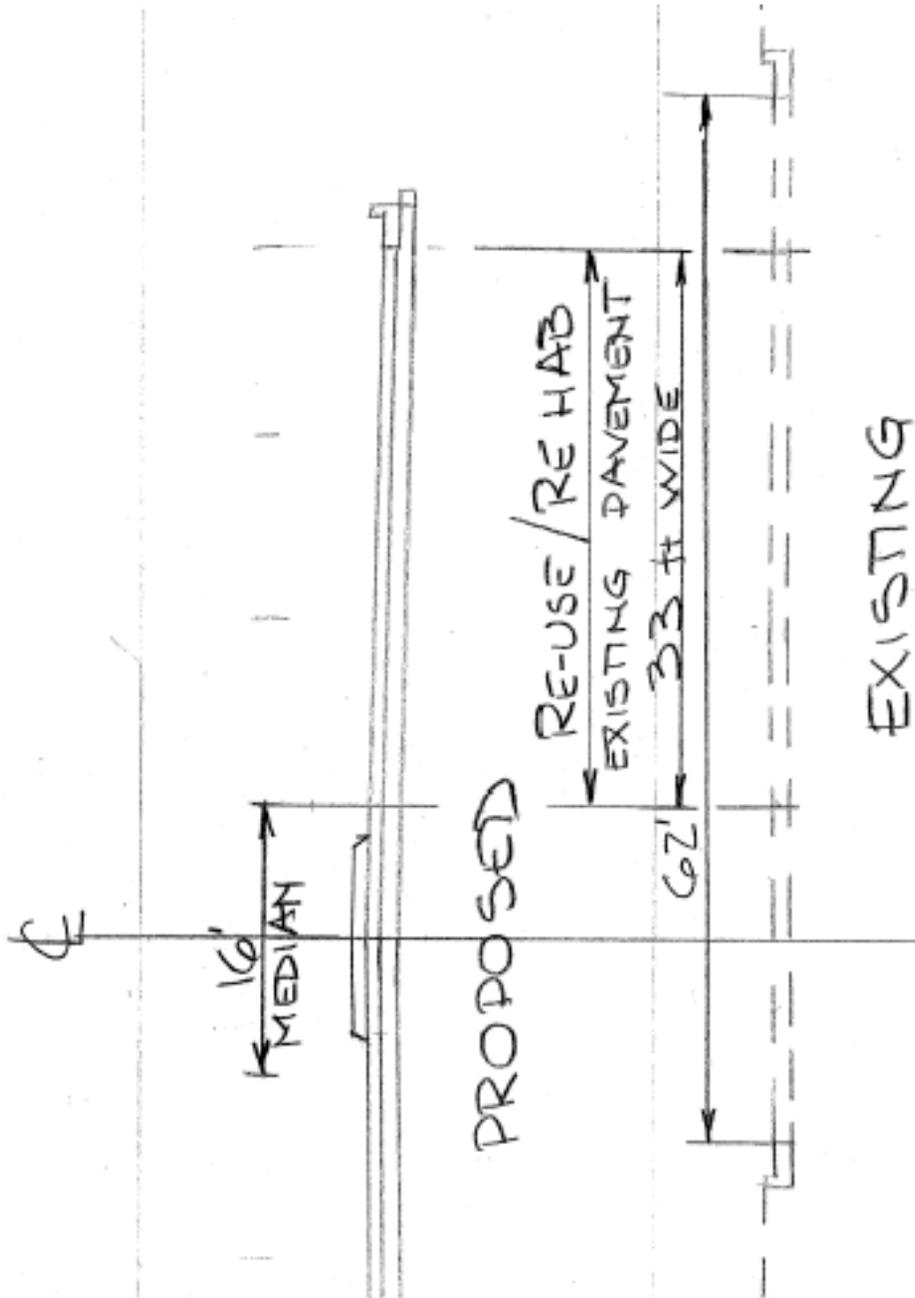
Assume re-use and re-habilitation of 33 feet of existing roadway, using a 3.5 inch overlay in lieu of full depth reconstruction. The cost saving would allow for up to 3 future resurfacings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	1,501,000		
<b>- Proposed</b>	375,000		
<b>- Savings</b>	1,126,000		1,126,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>1,126,000</b>

SKETCH

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-1  
CLIENT: GDOT  
Sheet 2 of 4





## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-1  
CLIENT: GDOT  
Sheet 4 of 4

From NB ramps to Cordele Road  
Station 28+00 to Station 93+00, total length 6,500 ft

Pavement excavation:  
6,500 ft x 33 ft x 1 ft thick = 214,500 cu ft = 23,833 cu yd

Full depth pavement cost:  
Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB

$$(10.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

Cost per Square Yard:

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \\ \$41.34 + 13.37 = \$54.71/\text{sy} \quad \text{Use: } \mathbf{\$55 \text{ per SY}}$$

Resurfacing cost, 3.5 inch overlay:

$$(3.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.021875 \text{ ton/sf}$$

$$(0.021875 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) = \$13.78 \text{ per sy} \quad \text{Use: } \mathbf{\$15 \text{ per SY}}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
A-2	1 of 4	Remove full-depth pavement under median	
Comp By: SWG		Date: 11/4/10	Checked By: DCW
		Date: 11/4/10	

**Original Concept:**

The original concept proposes to install full-depth pavement under the raised concrete median.

**Proposed Change:**

The revised concept proposes to install a raised grass median with Type 7 curb & gutter. No pavement will be installed in the median.

**Justification:**

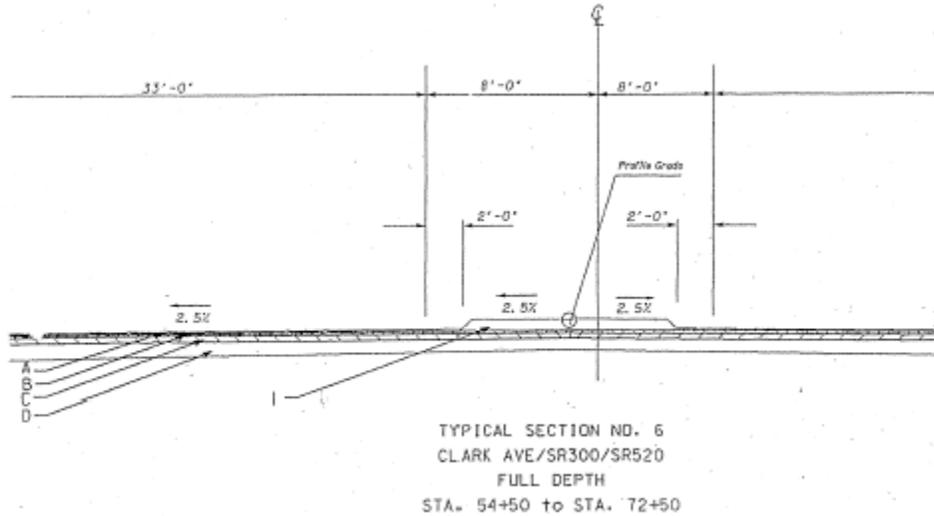
The function of the median is to separate traffic. This function can be accomplished without the installation of full-depth pavement under the median.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	827,000		
<b>- Proposed</b>	157,000		
<b>- Savings</b>	670,000		670,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>670,000</b>

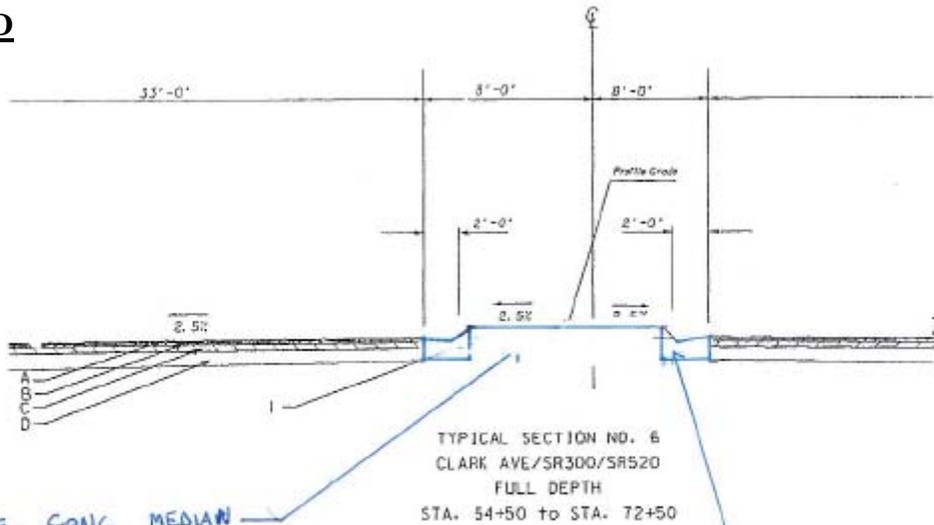
SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-2  
 CLIENT: GDOT  
 Sheet 2 of 4

ORIGINAL



PROPOSED



REMOVE CONC MEDIATE  
 PUNT AND FULL DEPTH  
 ASPHALT PUNT

INSTALL TYPE 7  
 CURB+ GUTTER



**CALCULATIONS****SR 300/Clark Ave. and Interchange Improvements**ITEM N<sup>o</sup>: A-2  
CLIENT: GDOT  
Sheet 4 of 4**Pavement Costs*****Original Mainline & Sideroad & Ramp Shoulder Pavement*****Asphalt pavement; SR 300: 10.5 inch asphalt / 12 inch GAB**

$$(10.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \\ \$41.34 + 13.37 = \$54.71/\text{SY} \quad \text{Use: } \$55 \text{ per SY}$$

**Area of Full-Depth Pavement**

$$\text{Area} = (2248-1400) \times (12.5) + (16) \times [(3345-3045)+(5063-4321)+(5380-5290)+(6500-5632)+(9000-7800)+(10231-10070)] + (25)(41083-40616) = 76,051 \text{ sf} = 8,450 \text{ sy}$$

**Original Concept**

Area (12.5mm) = 8,450 sy

Area (19 mm) = 8,450 sy

Area (25 mm) = 8,450 sy

Area (GAB) = 8,450 sy

Area (Concrete Median) =  $8,450 - 4 \times (4676) / 9 = 6,372 \text{ sy}$

Length (Type 7 C&amp;G) = 0 lf

**Revised Concept**

Area (12.5mm) = 0 sy

Area (19 mm) = 0 sy

Area (25 mm) = 0 sy

Area (GAB) = 0 sy

Length (Type 7 C&G) =  $2 \times (4676) = 9,352 \text{ lf}$

Area (Concrete Median) = 0 SY

**DEVELOPMENT AND RECOMMENDATION PHASE**

**SR 300/Clark Ave. and Interchange Improvements**

<b>IDEA No.:</b> A-2.1	<b>PAGE No.:</b> 1 of 5	<b>CREATIVE IDEA:</b> Reduce full-depth pavement thickness under median
---------------------------	----------------------------	--

Comp By: SWG      Date: 11/4/10      Checked By: DCW      Date: 11/4/10

**Original Concept:**

The original concept proposes to install full-depth pavement under the raised concrete median. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 7" of 25mm & 12" GAB.

**Proposed Change:**

The revised concept proposes to install a reduced-depth pavement section under the median. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 3" of 25mm & 8" GAB.

**Justification:**

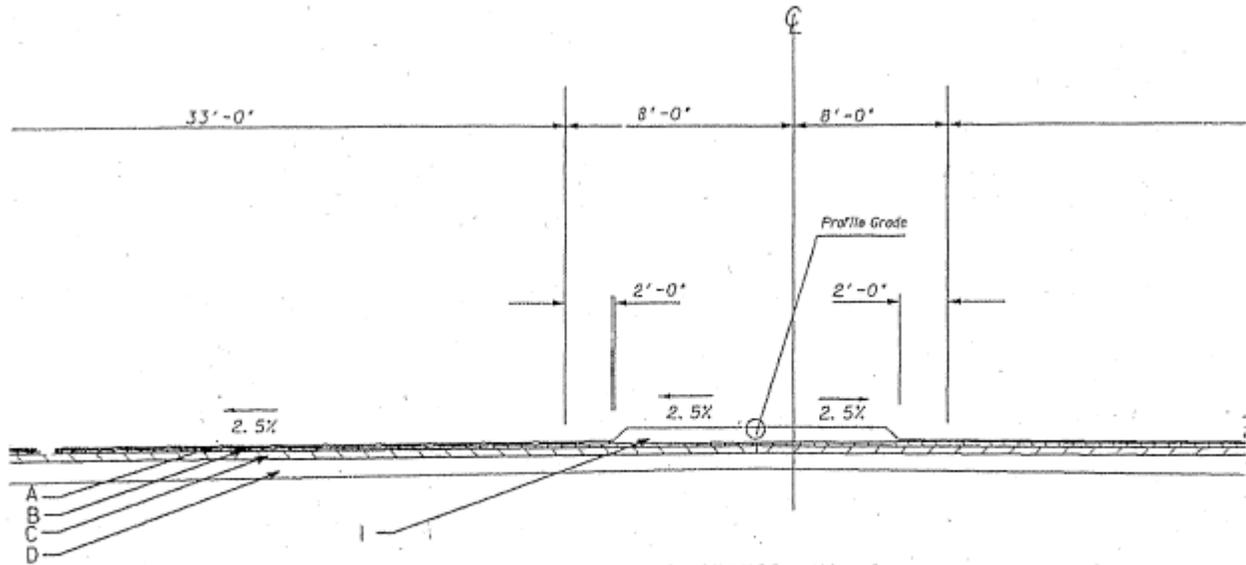
The function of the pavement under the median is to facilitate maintenance of traffic (staging) during construction and to support the median. The pavement section for temporary pavement will be adequate to serve this function and will result in significant cost savings.

<b>LIFE CYCLE COST SUMMARY</b>	<b>CAPITAL COST</b>	<b>FUTURE COST</b>	<b>PRESENT WORTH</b>
<b>INITIAL COST - Original</b>	488,000		
<b>- Proposed</b>	311,000		
<b>- Savings</b>	177,000		177,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>177,000</b>

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-2.1  
CLIENT: GDOT  
Sheet 2 of 5

ORIGINAL

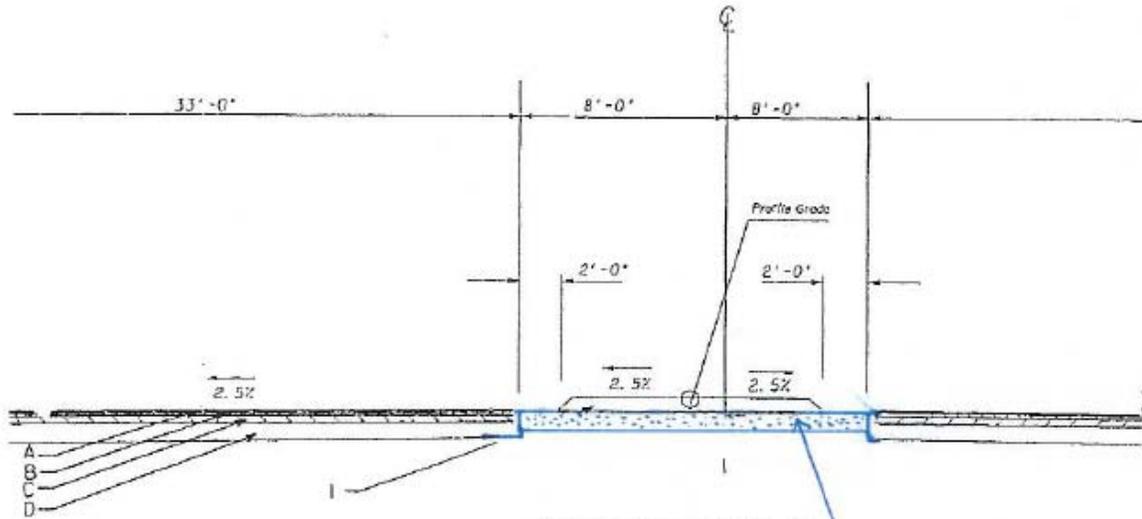


TYPICAL SECTION NO. 6  
CLARK AVE/SR300/SR520  
FULL DEPTH  
STA. 54+50 to STA. 72+50

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-2.1  
CLIENT: GDOT  
Sheet 3 of 5

**PROPOSED**



TYPICAL SECTION NO. 6  
CLARK AVE/SR300/SR520  
FULL DEPTH  
STA. 54+50 to STA. 72+50

INSTALL TEMPORARY  
PAVEMENT SECTION  
UNDER MEDIAN



## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-2.1  
CLIENT: GDOT  
Sheet 5 of 5

#### Pavement Costs

##### *Original Mainline & Sideroad & Ramp Shoulder Pavement*

###### Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB

$$(10.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ lb/cf}) (1 \text{ ton/ } 2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

##### Cost per SY

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \\ \$41.34 + 13.37 = \$54.71/\text{SY} \quad \text{Use: } \$55 \text{ per SY}$$

##### *Temporary Road Pavement*

###### Asphalt pavement; SR 3: 6.5 inch asphalt / 8 inch GAB

$$(6.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.0406 \text{ ton/sf}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.0450 \text{ ton/sf}$$

##### Cost per SY

$$(0.0406 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0450 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \$34.49/\text{SY} \\ \text{Use: } \$35 \text{ per SY}$$

#### Area of Full Depth Pavement

$$\text{Area} = (2248-1400)(12.5) + (16)[(3345-3045)+(5063-4321)+(5380-5290)+(6500-5632)+(9000-7800)+(10231-10070) + (25)(41083-40616)] = 76,051 \text{ sf} = 8,450 \text{ sy}$$

#### Original Concept

$$\text{Area (12.5mm)} = 8,450 \text{ sy}$$

$$\text{Area (19 mm)} = 8,450 \text{ sy}$$

$$\text{Area (25 mm)} = 8,450 \text{ sy}$$

$$\text{Area (GAB)} = 8,450 \text{ sy}$$

#### Revised Concept

$$\text{Area (12.5mm)} = 0 \text{ sy}$$

$$\text{Area (19 mm)} = 0 \text{ sy}$$

$$\text{Area (25 mm)} = 0 \text{ sy}$$

$$\text{Area (GAB)} = 0 \text{ sy}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
A-4	1 of 5	Reduce depth of pavement section on ramp shoulders	
Comp By: SWG	Date: 11/4/10	Checked By: DCW	Date: 11/4/10

**Original Concept:**

The original concept proposes to install the same pavement section on the ramp shoulders as is being installed on the ramps. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 7" of 25mm, and 12" GAB.

**Proposed Change:**

The revised concept proposes to install a reduced pavement section on the ramp shoulders. This pavement section is 1.5" of 12.5mm, 2" of 19mm, and 6" GAB.

**Justification:**

The function of the ramp shoulders is to support the occasional vehicle that pulls off the ramp, and not to support mainline traffic. A reduced pavement section will adequately serve this function and create significant cost savings.

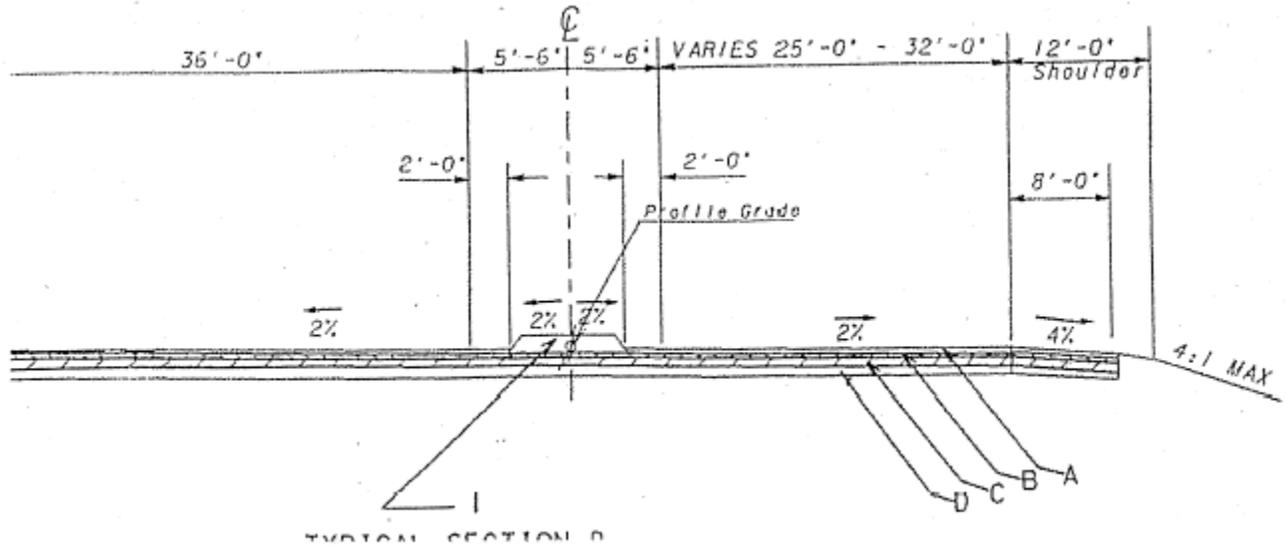
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	69,500		
<b>- Proposed</b>	26,500		
<b>- Savings</b>	43,000		43,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>43,000</b>

SKETCH

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-4  
CLIENT: GDOT  
Sheet 2 of 5

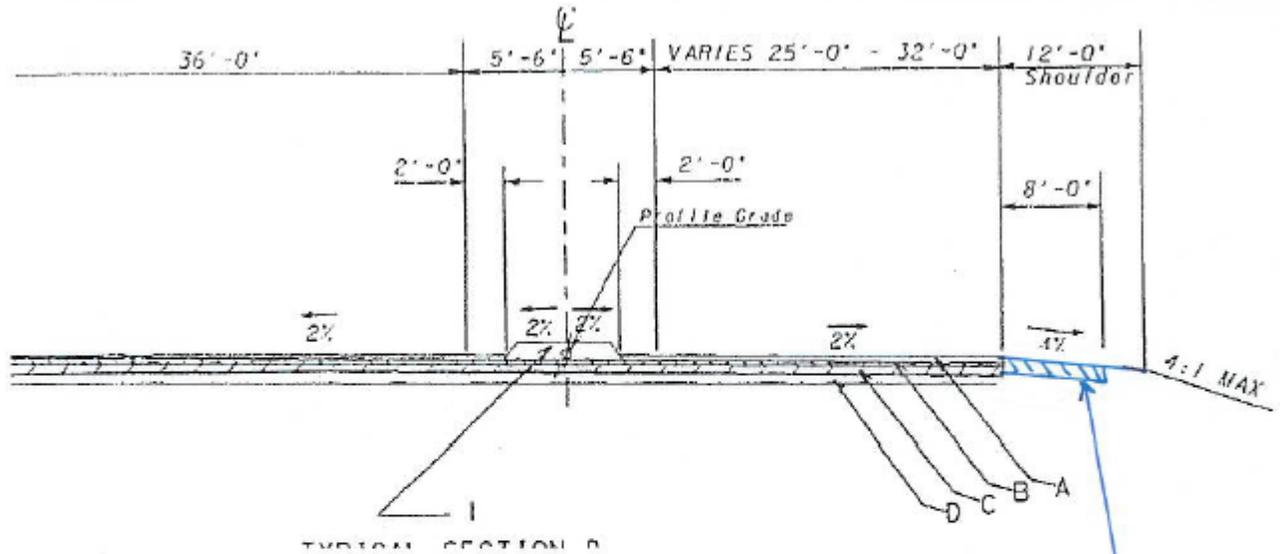
ORIGINAL



SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-4  
CLIENT: GDOT  
Sheet 3 of 5

**PROPOSED**



REDUCE PAVEMENT DEPTH  
FOR RAMP SHOULDERS



## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-4  
CLIENT: GDOT  
Sheet 5 of 5

#### Pavement Costs

##### *Original Mainline & Sideroad & Ramp Shoulder Pavement*

###### Asphalt pavement; SR 300: 10.5 inch asphalt / 12 inch GAB

$$(10.5/12 \text{ ft}) (150 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

Cost per SY -

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22 / \text{ton}) = \\ \$41.34 + 13.37 = \$54.71 / \text{SY} \quad \text{Use: } \$55 \text{ per SY}$$

##### *Revised Ramp Shoulder Pavement*

###### Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB

$$(3.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.0219 \text{ ton/sf}$$

$$(6/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.0338 \text{ ton/sf}$$

Cost per SY

$$(0.0219 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70 / \text{ton}) + (0.0338 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22 / \text{ton}) = \$20.49 / \text{SY} \\ \text{Use: } \$21 \text{ per SY}$$

##### **Area of Ramp Shoulder Pavement**

$$\text{Area} = 8 \times [2(24389-24145) + (25376-25124) + (25761-25146)] = 10,840 \text{ sf} = 1,204 \text{ sy}$$

##### **Original Concept**

$$\text{Area (Original Ramp Shoulder Pavement)} = 1,204 \text{ sy}$$

$$\text{Area (Revised Ramp Shoulder Pavement)} = 0 \text{ sy}$$

##### **Revised Concept**

$$\text{Area Original Ramp Shoulder Pavement} = 0 \text{ sy}$$

$$\text{Area Revised Ramp Shoulder Pavement} = 1,204 \text{ sy}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
A-7	1 of 5	Reduce depth of pavement section on Cordele Road	
Comp By: SWG	Date: 11/4/10	Checked By: DCW	Date: 11/4/10

**Original Concept:**

The original concept proposes to install the same full-depth pavement section for Cordele Road as Clark Avenue. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 7" of 25mm, and 12" GAB.

**Proposed Change:**

The revised concept proposes to install a reduced pavement section for Cordele Road. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 3" of 25mm, and 10" GAB.

**Justification:**

The traffic volumes on Cordele Road are significantly lower than those on Clark Avenue. A reduced pavement section for Cordele Road will support projected traffic.

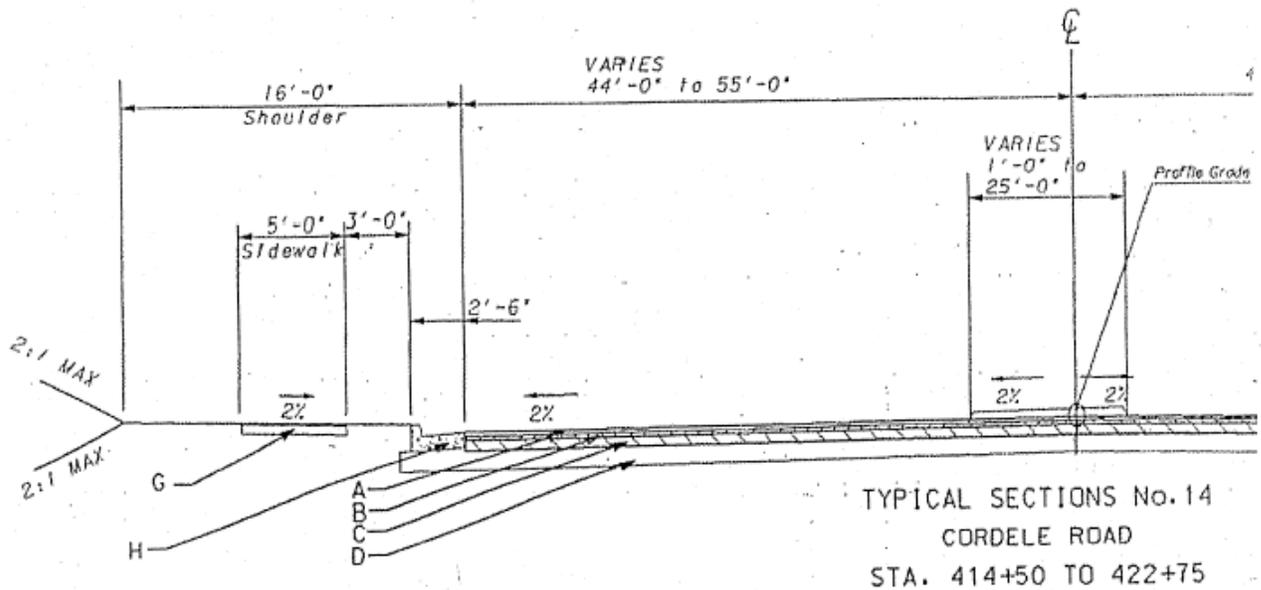
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	822,000		
<b>- Proposed</b>	553,000		
<b>- Savings</b>	269,000		269,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>269,000</b>

**SKETCH**

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: A-7  
CLIENT: GDOT  
Sheet 2 of 5

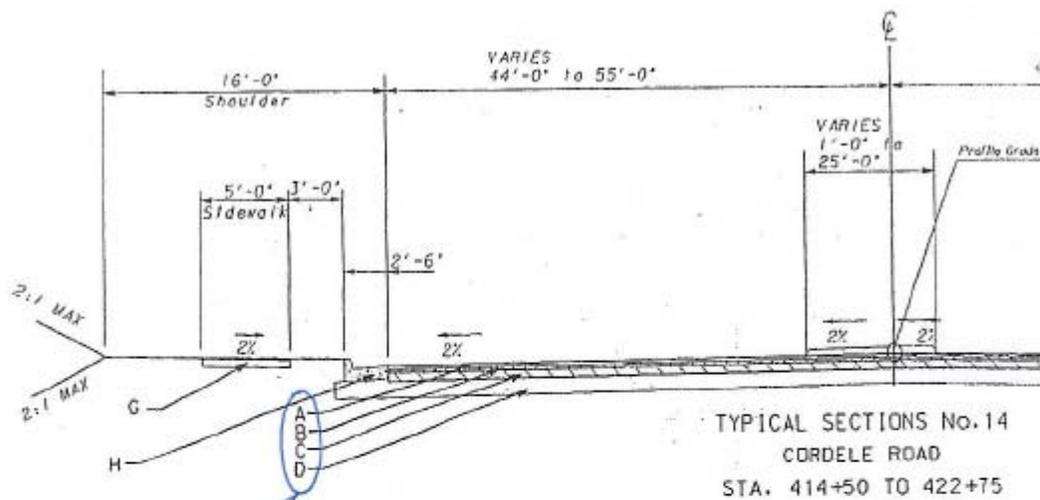
**ORIGINAL**



SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-7  
 CLIENT: GDOT  
 Sheet 3 of 5

**PROPOSED**



REDUCE PVMT DEPTH FOR CORDELE ROAD

- A - 16S #/SY 12.5 mm
- B - 220 #/SY 19 mm
- C - 330 #/SY 25 mm
- D - 10" GAB



## CALCULATIONS

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: A-7  
CLIENT: GDOT  
Sheet 5 of 5

### **Pavement Costs**

#### ***Original Mainline & Sideroad & Ramp Shoulder Pavement***

##### Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB

$$(10.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \$54.71/\text{SY}$$

**Use:** \$55 per SY

#### ***Revised Side Road Pavement***

##### Asphalt pavement; SR 3: 6.5 inch asphalt / 10 inch GAB

$$(6.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.0406 \text{ ton/sf}$$

$$(10/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton/ } 2000 \text{ lb}) = 0.0563 \text{ ton/sf}$$

Cost per SY

$$(0.0406 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0563 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \$36.73/\text{SY}$$

**Use:** \$37 per SY

#### **Area of Cordele Road**

$$\text{Area} = (60) \times (41500-40265) + (80) \times (42275-41600) = 128,100 \text{ sf} = 14,233 \text{ sy}$$

#### **Original Concept**

$$\text{Area (Original Sideroad Pavement)} = 14,233 \text{ sy}$$

$$\text{Area (Revised Sideroad Pavement)} = 0 \text{ sy}$$

#### **Revised Concept**

$$\text{Area (Original Sideroad Pavement)} = 0 \text{ sy}$$

$$\text{Area (Revised Sideroad Pavement)} = 14,233 \text{ sy}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
A-7.1	1 of 5	Implement mill and inlay on Cordele Road	
Comp By: SWG	Date: 11/4/10	Checked By: DCW	Date: 11/4/10

**Original Concept:**

The original concept proposes to install the same full-depth pavement section for Cordele Road as for Clark Avenue. This pavement section is 1.5" of 12.5mm, 2" of 19mm, 7" of 25mm, and 12" GAB.

**Proposed Change:**

The revised concept proposes to implement 1.5" milling and 1.5" overlay (12.5mm) for Cordele Road.

**Justification:**

The 2009 pavement evaluation report recommends 1.5" milling and 1.5" overlay (12.5mm) for Cordele Road.

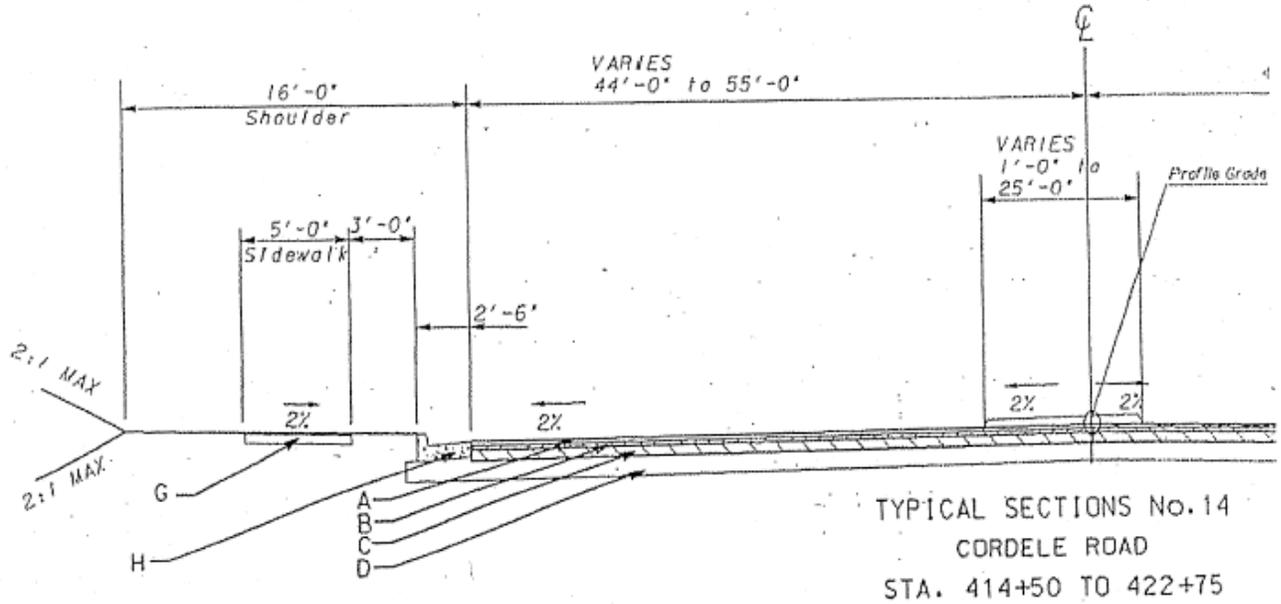
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	822,000		
<b>- Proposed</b>	153,000		
<b>- Savings</b>	669,000		669,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>669,000</b>

**SKETCH**

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: A-7.1  
CLIENT: GDOT  
Sheet 2 of 5

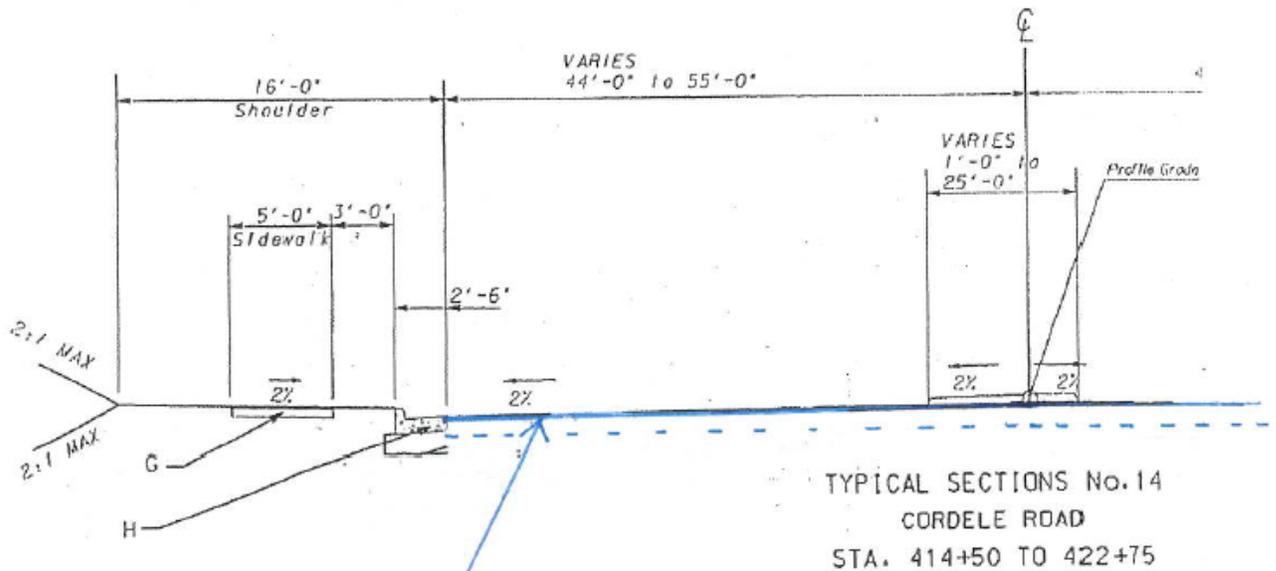
**ORIGINAL**



SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: A-7.1  
CLIENT: GDOT  
Sheet 3 of 5

**PROPOSED**



IMPLEMENT MILLING AND  
OVERLAY INSTEAD OF  
FULL DEPTH PAVT



**CALCULATIONS****SR 300/Clark Ave. and Interchange Improvements**ITEM N<sup>o</sup>: A-7.1  
CLIENT: GDOT  
Sheet 5 of 5**Pavement Costs*****Original Mainline & Sideroad & Ramp Shoulder Pavement*****Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB**

$$(10.5/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton}/2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

**Cost per SY**

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \$54.71/\text{SY}$$

**Use:** \$55 per SY***Mill & Inlay***

$$\text{Cost (1.5" Milling)} = \$4.12/\text{sy}$$

$$\text{Cost (1.5" of 12.5mm Overlay)} = (165 \text{ lb/sy}) \times (1 \text{ ton}/2000 \text{ lb}) \times (\$74.17/\text{ton}) = \$6.12/\text{sy}$$

$$\text{Total Cost (Mill & Inlay)} = \$10.24/\text{sy}$$

**Area of Cordele Street**

$$\text{Area} = (60) \times (41500-40265) + (80) \times (42275-41600) = 128,100 \text{ sf} = 14,233 \text{ sy}$$

**Original Concept**

$$\text{Area (Original Sideroad Pavement)} = 14,233 \text{ sy}$$

$$\text{Area (Mill & Inlay)} = 0 \text{ sy}$$

**Revised Concept**

$$\text{Area (Original Sideroad Pavement)} = 0 \text{ sy}$$

$$\text{Area (Mill & Inlay)} = 14,233 \text{ sy}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
B-1	1 of 3	Narrow the shoulder to 12 feet
Comp By: GAO		Date: 11/2/10
		Checked By: DCW
		Date: 11/2/10

**Original Concept:**

Use standard urban shoulder, 16 feet wide.

**Proposed Change:**

Reduce the shoulder width to 12 feet; keep curb and gutter and sidewalk. Apply this recommendation to both sides of the road; however, it can be used on only one side, most likely the north, if more suitable.

**Justification:**

This is considered an urban section and several reductions have already been incorporated into the design, including narrower lanes and median. A 12-foot wide shoulder will continue to allow for sidewalks and utilities while reducing the construction costs, right of way impacts, and providing the same project function.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	318,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	318,000		318,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>318,000</b>



## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-1  
CLIENT: GDOT  
Sheet 3 of 3

Station: 8+00 to Station 93+00; total length 8,500 ft

#### Right of way savings:

$$8,500 \times 2 \times 4 = 68,000 \text{ sq ft}$$

#### Grading /Earthwork :

4 ft wide, average height – 2 ft  
 $(4 \times 2 \times 8,500 \text{ ft}) \times 2 \text{ sides} = 136,000 \text{ cf} = 5,037 \text{ cy}$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b> B-4	<b>PAGE No.:</b> 1 of 5	<b>CREATIVE IDEA:</b> Shift SR 300/ Clark Avenue alignment north in the vicinity of the water tower
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Comp By: GAO      Date: 11/2/10      Checked By: DCW      Date: 11/2/10

**Original Concept:**

The current design shifts the SR 300 / Clark Avenue alignment to the south about 20 feet to minimize impacts to the existing water tower. The roadway alignment in this area is on a tangent section and the shift introduces curves to the alignment. The shift will have impacts to the proposed construction staging schemes and traffic patterns.

**Proposed Change:**

Maintain the tangent alignment through the area of the water tower.

**Justification:**

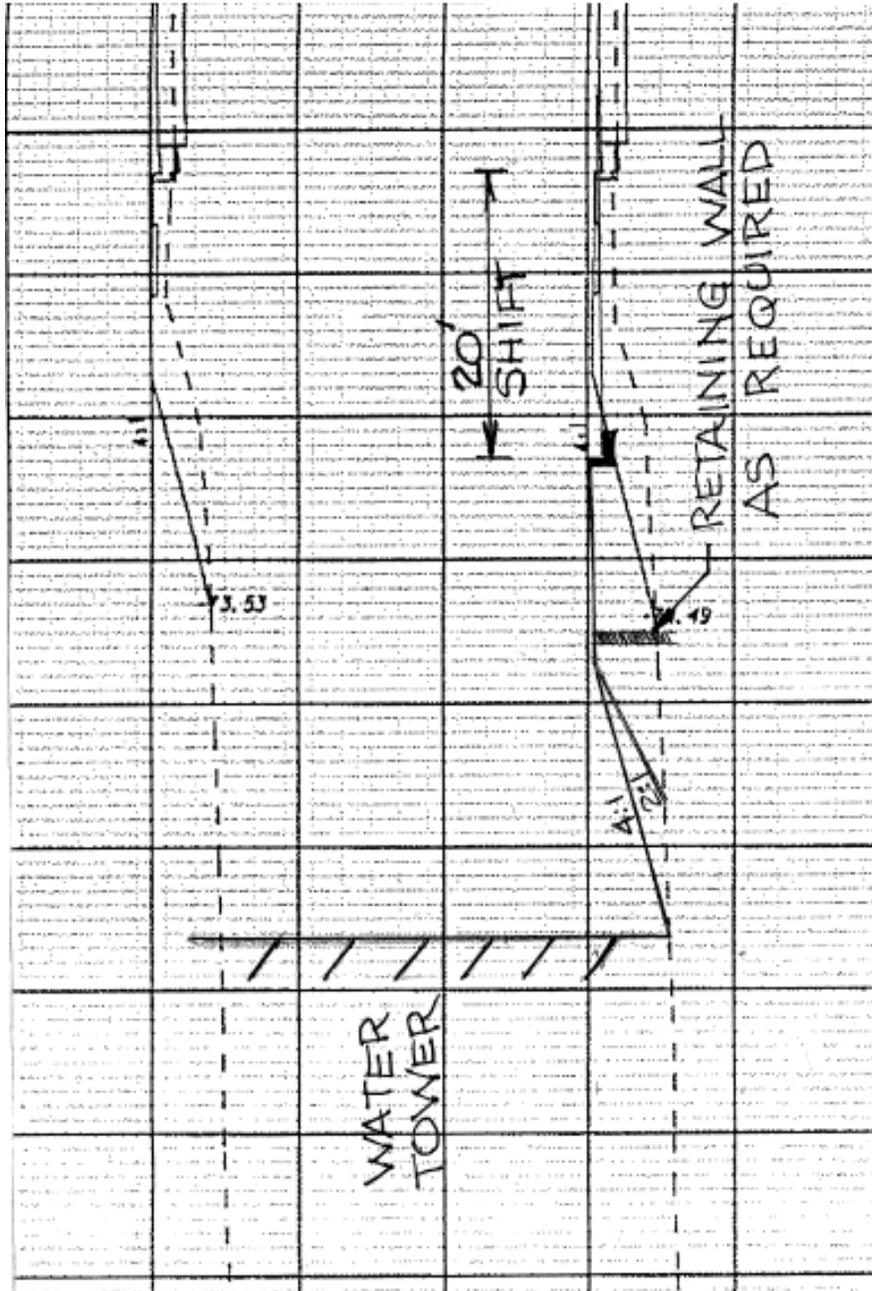
The existing SR 300/ Clark Avenue alignment through this area is on a tangent. A horizontal alignment shift of about 20 feet to the south was developed to minimize impacts to the existing water tower located in the central portion of this project. This alignment shift introduces construction staging difficulties that will require temporary pavement construction. If the tangent alignment is maintained throughout the project, the construction staging scheme will be consistent (requiring no traffic shift) and the temporary pavement construction will be eliminated. Even with a 4:1 sideslope, there should be no adverse effects to the water tower. However, the limit of grading will be close to the base of the tower. Any adverse effects can be reasonably mitigated with steeper side slopes (2:1), a low (3-4 foot) retaining wall, and/or a minor realignment in the access driveway.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	273,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	273,000		273,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>273,000</b>



SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-4  
CLIENT: GDOT  
Sheet 3 of 5





## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-4  
CLIENT: GDOT  
Sheet 5 of 5

This recommendation does not affect or propose changes to the typical section or right of way widths. Therefore, all typical section elements, including right of way and construction costs, will remain the same.

Potential savings as part of this recommendation will be reductions in temporary pavement required to facilitate the traffic shift.

Temporary pavement:

$$(800 \text{ ft long} \times 26 \text{ ft wide}) + [\frac{1}{2} (400 \times 26) \times 2] \text{ (transitions)}$$
$$20,800 \text{ sq ft} + 10,400 \text{ sq ft} = 31,200 \text{ sq ft} = 3,467 \text{ sq yd}$$

Assume \$75 per sq yd for temporary pavement including earthwork, removal and disposal.

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b> B-6	<b>PAGE No.:</b> 1 of 5	<b>CREATIVE IDEA:</b> Implement rural section on north side of Clark Avenue from Sta 28+00 to 93+00
-------------------------	----------------------------	--

Comp By: SWG      Date: 11/4/10      Checked By: DCW      Date: 11/4/10

**Original Concept:**

The original concept proposes to implement a 16' urban shoulder with curb and gutter and sidewalk from Clark Avenue Sta 28+00 to 93+00.

**Proposed Change:**

The revised concept proposes to implement a 10' rural shoulder (2' paved/ 8' grass) from Clark Avenue Sta 28+00 to 93+00. No sidewalk is proposed in this area.

**Justification:**

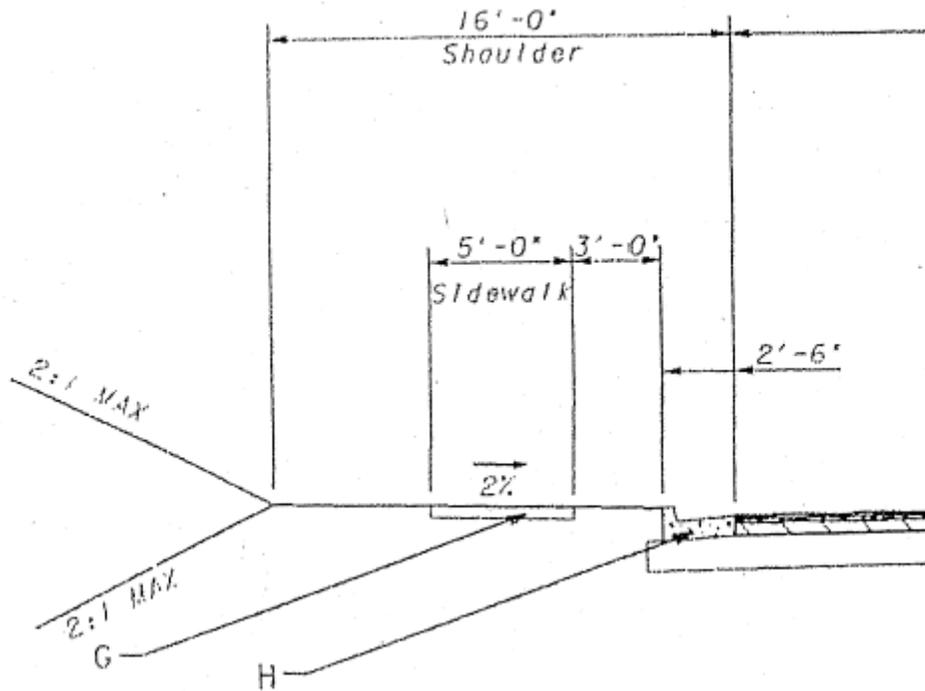
The north side of Clark Avenue is undeveloped from Sta 28+00 to 93+00 and no sidewalk is necessary to connect existing commercial or residential properties. The longitudinal drainage system present along the north side of Clark Avenue can be replaced by the installation of a ditch with adequate capacity. Significant cost savings in curb and gutter, storm drainage, and sidewalk will result from implementing the revised concept.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	604,000		
<b>- Proposed</b>	118,000		
<b>- Savings</b>	486,000		486,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>486,000</b>

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-6  
CLIENT: GDOT  
Sheet 2 of 5

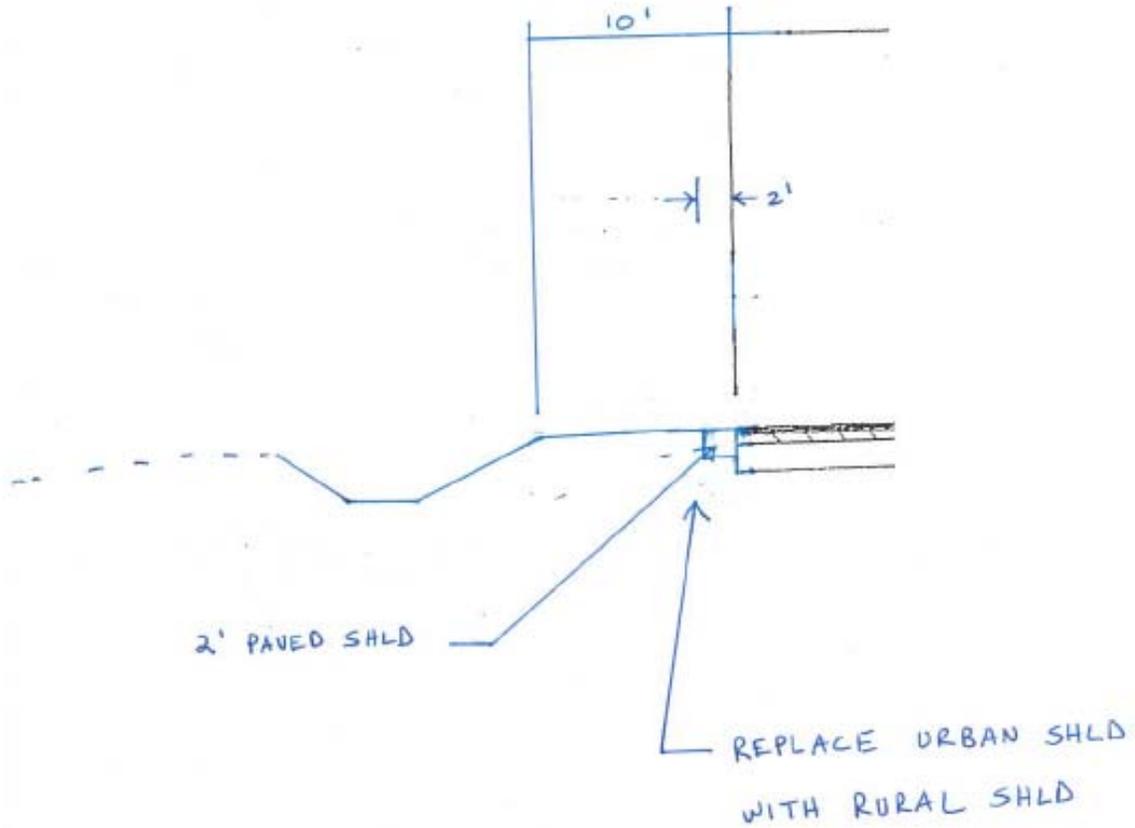
ORIGINAL



SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-6  
CLIENT: GDOT  
Sheet 3 of 5

**PROPOSED**





## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: B-6  
CLIENT: GDOT  
Sheet 5 of 5

#### Assumptions

1. Roadway Profile can be adjusted to optimize construction limits for rural/ditch section instead of urban section.
2. 5' additional easement will be required to accommodate ditch section. This additional 5' width + 6' shoulder reduction width + profile optimization will allow for implementation of the ditch section.
3. The right-of-way unit cost for residential land may be used for the undeveloped property in this area.
4. Additional excavation for ditches will be offset by reduction of shoulder embankment.

#### Original Concept

Area (sidewalk) =  $5 \times (9300 - 2800) / 9 = 3,611$  sy  
Length (curb & gutter) =  $(9300 - 2800) = 6,500$  lf  
No. of catch basins = 40  
Length 18" pipe = 3,900 lf  
Length 24" pipe = 1,150 lf  
Additional easement = 0 sf  
2' Paved shoulder = 0 sy

#### Revised Concept

Area (sidewalk) = 0 sy  
Length (curb & gutter) = 0 lf  
No. of catch basins = 0  
Length 18" pipe = 0 lf  
Length 24" pipe = 0 lf  
Additional easement =  $5 \times (9300 - 2800) = 32,500$  sf  
2' Paved shoulder =  $(9300 - 2800) \times 2 / 9 = 1,444$  sy

**DEVELOPMENT AND RECOMMENDATION PHASE**

**SR 300/Clark Ave. and Interchange Improvements**

<b>IDEA No.:</b> C-3	<b>PAGE No.:</b> 1 of 3	<b>CREATIVE IDEA:</b> Eliminate 6 inch graded base extension
Comp By: GAO	Date: 11/3/10	Checked By: DCW
		Date: 11/3/10

**Original Concept:**

Construct 12-inch-thick graded aggregate base 6 inches beyond the limit of the curb and gutter.

**Proposed Change:**

Eliminate the construction of the 6 inch graded aggregate base beyond the curb and gutter.

**Justification:**

The construction of 6 inches of graded aggregate base material beyond the limit of the curb and gutter can be eliminated with no adverse impacts to the integrity of the design. It is included as a construction measure intended to provide additional support for the roadway template.

We have received previous direction from other projects in the District where this was eliminated. Though the cost savings are marginal, elimination of the 6 inch graded aggregate base extension could be considered on this project.

<b>LIFE CYCLE COST SUMMARY</b>	<b>CAPITAL COST</b>	<b>FUTURE COST</b>	<b>PRESENT WORTH</b>
<b>INITIAL COST - Original</b>	35,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	35,000		35,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>35,000</b>



## CALCULATIONS

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: C-3  
CLIENT: GDOT  
Sheet 3 of 3

Station 6+21 to Station 104+00; total length = 9,779 ft

$$9,779 \times 2 \times 0.5 = 9,779 \text{ sq ft} = 1,086 \text{ sq yd}$$

**DEVELOPMENT AND RECOMMENDATION PHASE**

**SR 300/Clark Ave. and Interchange Improvements**

<b>IDEA No.:</b> D-1	<b>PAGE No.:</b> 1 of 3	<b>CREATIVE IDEA:</b> Use spillways in lieu of catch basins in areas with ditches
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Comp By: GAO      Date: 11/3/10      Checked By: DCW      Date: 11/3/10

**Original Concept:**

Construct catch basins and piping to catch and convey run-off.

**Proposed Change:**

In the area (from School Street to North Mock Road) that also provides an open ditch, use spillways in lieu of catch basins and piping to convey the storm-water run-off. Provide either a steel plate or a special design sidewalk channel for the sidewalk continuity.

**Justification:**

With the proposed typical section, there is redundancy in providing both a closed and open drainage system. This recommendation would eliminate the closed drainage system and maintain the open system. However, the typical urban dimensions and curb and gutter will be provided using a special design for sidewalk continuity.

<b>LIFE CYCLE COST SUMMARY</b>	<b>CAPITAL COST</b>	<b>FUTURE COST</b>	<b>PRESENT WORTH</b>
<b>INITIAL COST - Original</b>	90,200		
<b>- Proposed</b>	15,100		
<b>- Savings</b>	75,100		75,100
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>75,100</b>



**CALCULATIONS**

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: D-1  
CLIENT: GDOT  
Sheet 3 of 3

Station 54+50 to Station 72+50, total length = 1,800 ft

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
D-2	1 of 6	Use roadside ditches/ bioswales in lieu of detention ponds

Comp By: GAO      Date: 11/3/10      Checked By: DCW      Date: 11/3/10

**Original Concept:**

Construct detention ponds at two locations on the project. The detention areas were developed based on downstream conditions and system capacity

**Proposed Change:**

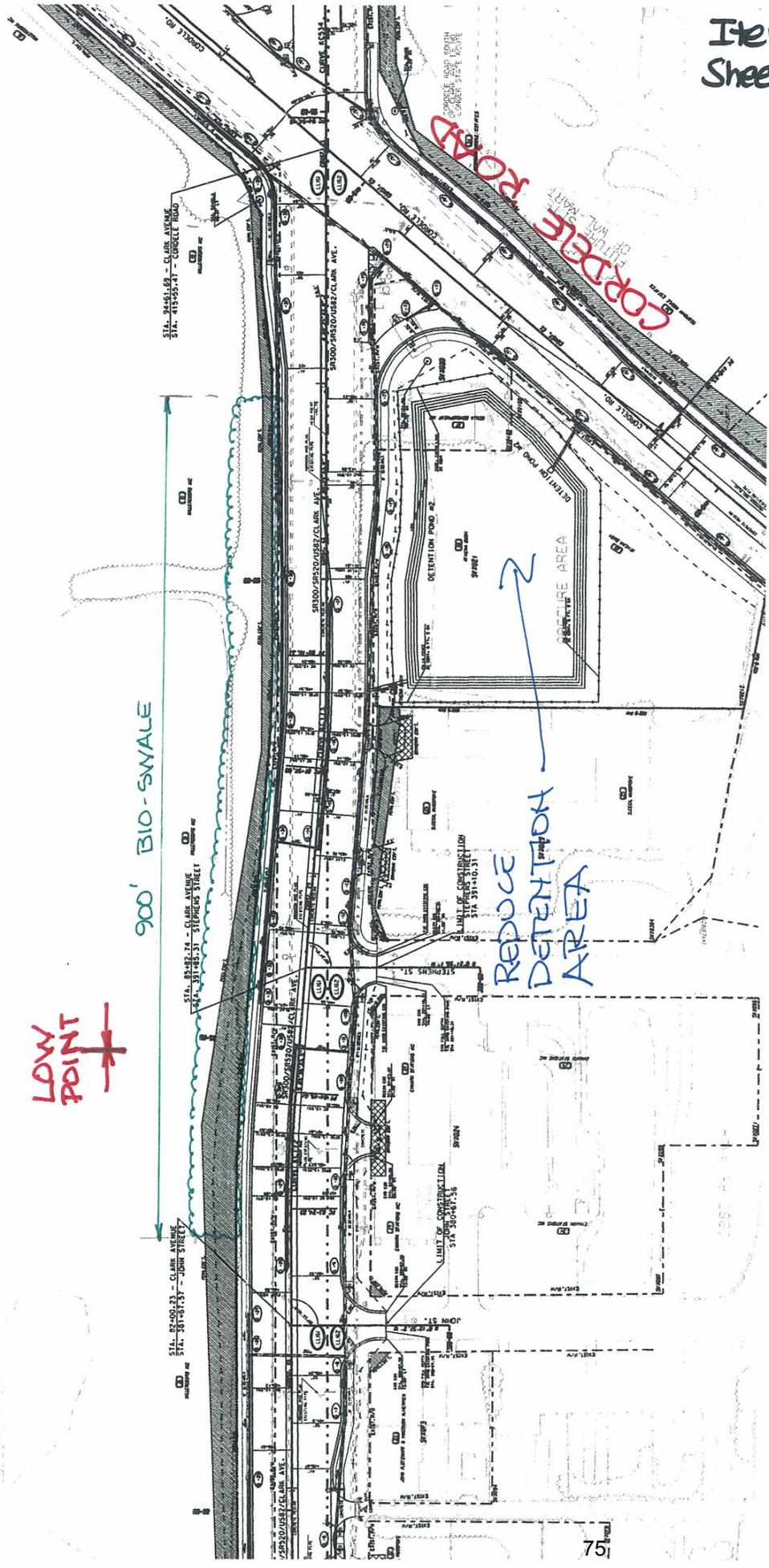
Review the drainage design to minimize and/or eliminate the detention areas using oversized roadside ditches that can also be developed into bioswales.

**Justification:**

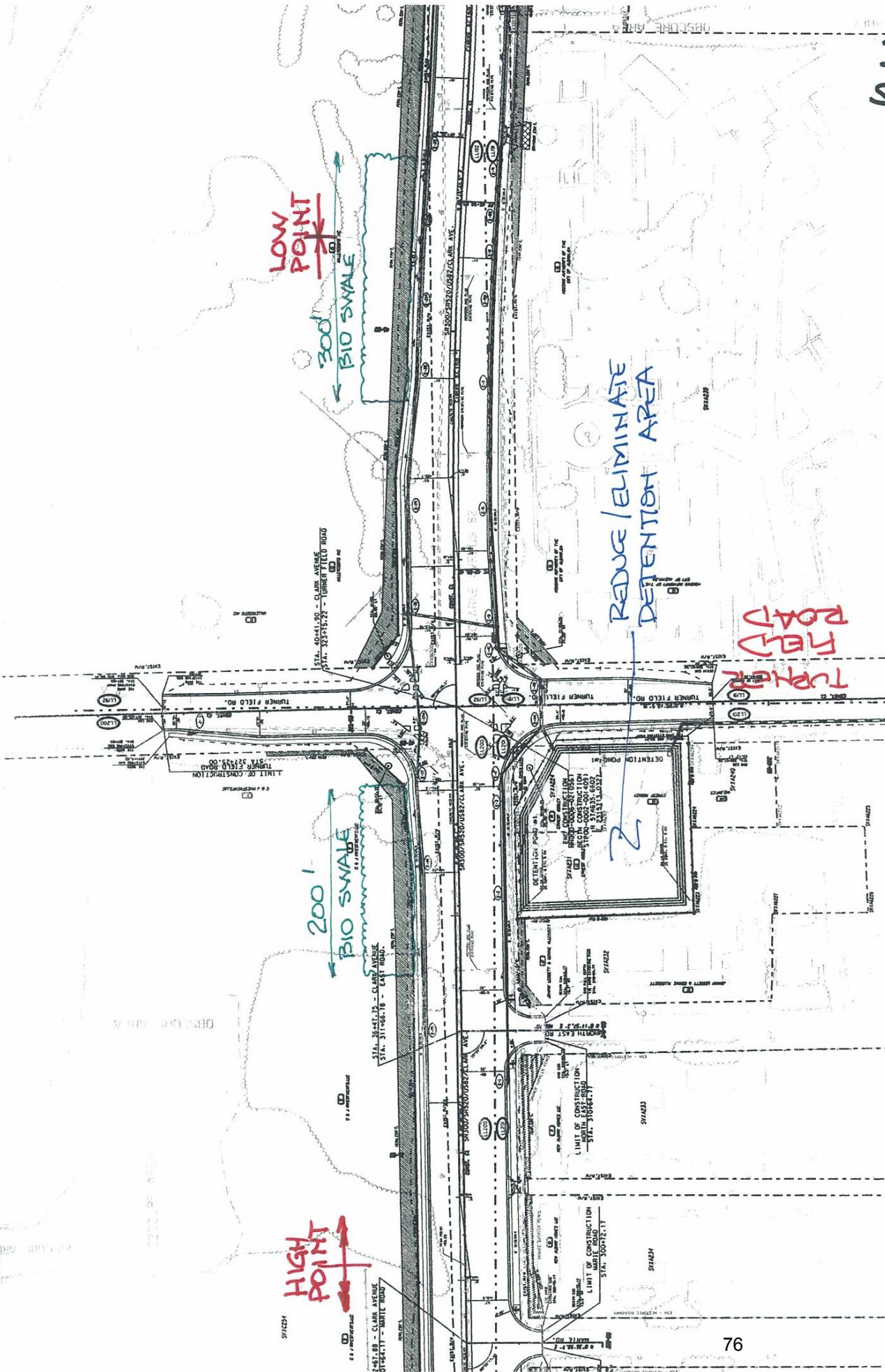
Eliminating detention areas will reduce long term maintenance and security concerns for fenced-in conventional detention ponds. GDOT does not typically provide detention facilities. This recommendation will require a detailed review of the drainage design and hydrology. The current layout provides for all the run-off to be collected and piped to the detention areas, while this recommendation proposes to provide smaller areas, roadside ditches, and bioswales to reduce maintenance and security issues. The location of the proposed swales is on the northern side of the roadway that is currently undeveloped. Incorporating roadside ditches could also eliminate the need for the longitudinal piping system, and swales can be used in lieu of catch basins. The areas for ditches vs. detention are generally similar; however, additional right-of-way or easements could be required. They will be within the MillerCoors property, which should all be negotiated comprehensively. This solution is somewhat more environmentally friendly and could be viewed as an amenity by the property owner.

The costs shown below assume earthwork (grading complete) and right-of-way items are the same in both options.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	126,000		
<b>- Proposed</b>	24,600		
<b>- Savings</b>	101,400		101,400
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>101,400</b>



Item No. D-2  
Sheet 3 of 6



**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: D-2  
CLIENT: GDOT  
Sheet 4 of 6



**Sample Bioswale**

<b>COST WORKSHEET</b>							
PROJECT: <b>SR 300/SR520/Clark Ave. between Turner Field and SR 62 and SR 3 @ Clark Ave.Ramp</b>					ITEM No: D-2		
					CLIENT: GDOT		
					Sheet 5 of 6		
CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Detention Area 1							
Curb and gutter	LF	Same for both Original and New estimates					
18" RCP	LF	300	44.41	13,323			
24" RCP	LF	600	61.88	37,128			
Catch basin	EA	7	2,188	15,319			
Spillway	EA				7	1,800	12,600
Detention Area 2							
Curb and gutter	LF	Same for both Original and New estimates					
18" RCP	LF	300	44.41	13,323			
24" RCP	LF	450	61.88	27,846			
Catch basin	EA	6	2,188	13,131			
Spillway	EA				6	1,800	10,800
SUBTOTAL							
				120,070	23,400		
Markup 5.00%				6,004	1,170		
TOTAL							
				126,074	24,570		
TOTAL ROUNDED							
				126,000	24,600		

## CALCULATIONS / ASSUMPTIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: D-2  
CLIENT: GDOT  
Sheet 6 of 6

Assume a 30 foot wide, 3 foot deep bioswale/ ditch section, although the specific size and make-up can be adjusted based on detailed hydrology analysis. This section provides 126 cf/lf of storage.

#### Detention Area 1 at Turner Field Road

170' x 190' x 4' deep = 129,200 cu ft of storage

Equivalent length:  $129,200 / 126 = 1,025$  linear feet of bioswale/ ditch

#### Detention Area 2 at Cordele Road

260' x 180' x 5' deep = 234,400 cu ft of storage

Equivalent length:  $234,400 / 126 = 1,857$  linear feet of bioswale/ ditch

Assume the WB roadway (northern) section will drain to the bioswale – half the required capacity.

Detention Area 1 = 512 lf

Detention Area 2 = 930 lf

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
D-4	1 of 4	Use modified rural section in select area	
Comp By: GAO	Date: 11/3/10	Checked By: DCW	Date: 11/3/10

**Original Concept:**

Provide urban section with curb and gutter, sidewalk, and open ditch to catch off-site run-off.

**Proposed Change:**

In the area from School Street to North Mock Road, revise the typical section to a modified rural section, eliminating the curb and gutter and closed drainage system. Keep the open ditch and move the sidewalk to the outside of the typical section.

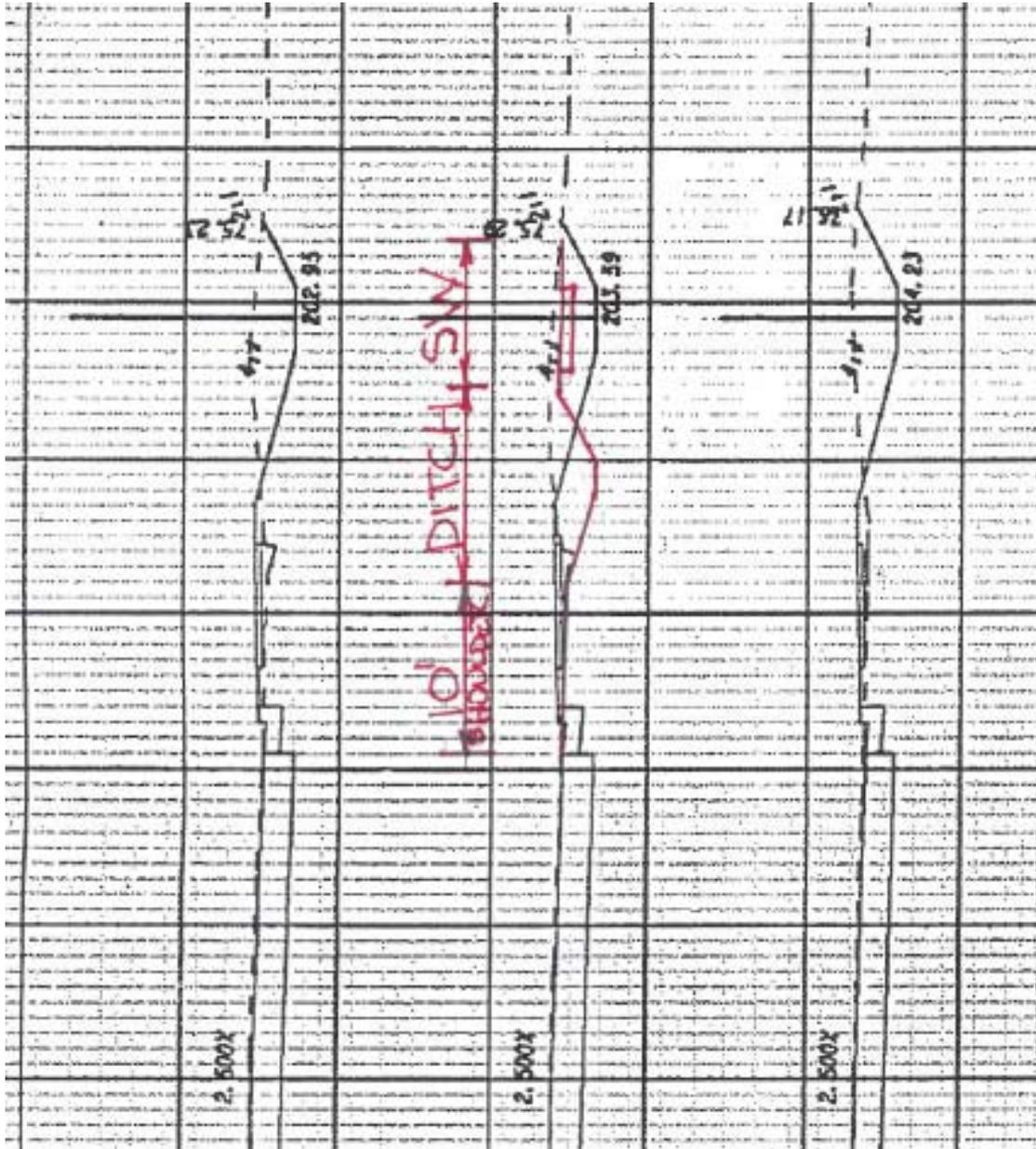
**Justification:**

With the proposed typical section, there is redundancy in providing both a closed and open drainage system. This recommendation would eliminate the closed drainage system and maintain the open system. It is in the area of the trailer park where most of the trailers are either abandoned or being purchased as an easement. The sidewalk will be moved to the outside of the typical section, further from the travelled way. The area is shown as permanent easement which would have to be converted to right-of-way, similar costs.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	121,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	121,000		121,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>121,000</b>

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: D-4  
CLIENT: GDOT  
Sheet 2 of 4





**CALCULATIONS**

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: D-4  
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Station 54+50 to Station 72+50, total length = 1,800 ft

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
E-1	1 of 3	Reduce the median width from 16 feet to 6 feet
Comp By: GAO		Date: 11/2/10
		Checked By: DCW
		Date: 11/2/10

**Original Concept:**

Construct a 16 foot wide raised median with left and U-turn lanes.

**Proposed Change:**

Reduce the width of the median between the intersections where left turn lanes are required to 6 feet; a 2 foot raised median with 2 foot offsets on both sides.

**Justification:**

Clark Avenue is an urban roadway where a narrower median could be more appropriate. Narrowing to a 6 foot median with a 2 foot raised curb will save right of way impacts and overall construction costs while maintaining positive delineation between opposing directions of traffic. This calculation is based on eliminating the EB U-turn at station 53+25 and shortening the left turn lane at station 70+00.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	510,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	510,000		510,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>510,000</b>



## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: E-1  
CLIENT: GDOT  
Sheet 3 of 3

#### Applicable areas:

Sta. 43+25 to Sta. 53+25; total distance – 1,000 ft

Sta. 56+25 to Sta. 70+50; total distance – 1,425 ft

Sta. 78+00 to Sta. 90+00; total distance – 1,200 ft

#### Taper lengths – 45 mph design speed; 10 foot shift

$$L = W \times DS \times DS / 60$$

$$L = 10 \times 45 \times 45 / 60 = 337.5; \text{Use } 340 \text{ ft}$$

#### Total length of affected median:

$$(1,000 - 340) + (1,425 - 340) + (1,200 - 340) = 660 + 1,085 + 860 = 2,605 \text{ ft}$$

Pavement Area = 2,605 ft x 10 ft = 26,050 sf = 2,894 SY

Right of way area will be similar

#### Full depth pavement cost:

#### Asphalt pavement; SR 3: 10.5 inch asphalt / 12 inch GAB

$$(10.5 / 12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.065625 \text{ ton/sf}$$

$$(12/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton} / 2000 \text{ lb}) = 0.0675 \text{ ton/sf}$$

#### Cost per SY

$$(0.065625 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$70/\text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$22/\text{ton}) = \\ \$41.34 + 13.37 = \$54.71/\text{SY} \quad \text{Use: } \$55 \text{ per SY}$$





## CALCULATIONS

**SR 300/Clark Ave. and Interchange Improvements**

ITEM N<sup>o</sup>: G-1  
CLIENT: GDOT  
Sheet 3 of 3

Station 28+00 to Station 93+00;

Total distance = 6,500 feet

$6,500 \times 5 \text{ feet} = 32,500 \text{ sq ft} = 3,611 \text{ sq yds}$

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
G-2	1 of 3	Use asphalt sidewalks in lieu of concrete	
Comp By: DCW		Date: 11/3/10	Checked By: GO
		Date: 11/3/10	

**Original Concept:**

4 inches of concrete sidewalk is indicated for both the 5 foot and 8 foot widths throughout the project. Special base material is not addressed.

**Proposed Change:**

Use 4 inches of asphalt material in the same locations with 4 inches of GAB as a base course.

**Justification:**

The asphalt material functions well in the urban environment with equivalent maintenance costs. Repair is easier than concrete and the elimination of joints prevents possible water intrusion and frost heave issues associated with concrete. Root growth from nearby trees and the associated heave of sidewalks is more readily absorbed by asphalt (uplift rolls in lieu of raising the block), thereby minimizing unevenness of the sidewalk surface which results in a tripping hazard.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	563,000		
<b>- Proposed</b>	300,000		
<b>- Savings</b>	263,000		263,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>263,000</b>



## CALCULATIONS

### SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: G-2  
CLIENT: GDOT  
Sheet 3 of 3

Sidewalk quantity from cost estimate = 4,179 sy + 9,665 sy = 13,844 sy = 124,596 SF

Asphalt = 0.33 ft x 124,596 sf x 150 lb/cu ft ÷ 2,000 lb/ton = 3,084 ton

Cost 4 inches GAB = 4 / 6 x \$8.12/ sy = \$5.41/ SY

## DEVELOPMENT AND RECOMMENDATION PHASE

### SR 300/Clark Ave. and Interchange Improvements

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
G-4	1 of 3	Use alternate detail for under-bridge pier protection
Comp By: GAO		Date: 11/3/10
		Checked By: DCW
		Date: 11/3/10

**Original Concept:**

Use concrete side barrier against the bridge piers. Place backfill and additional slope paving to address run-off.

**Proposed Change:**

Consider using an alternate design of guardrail. This could also address any drainage or ponding concerns under the bridge.

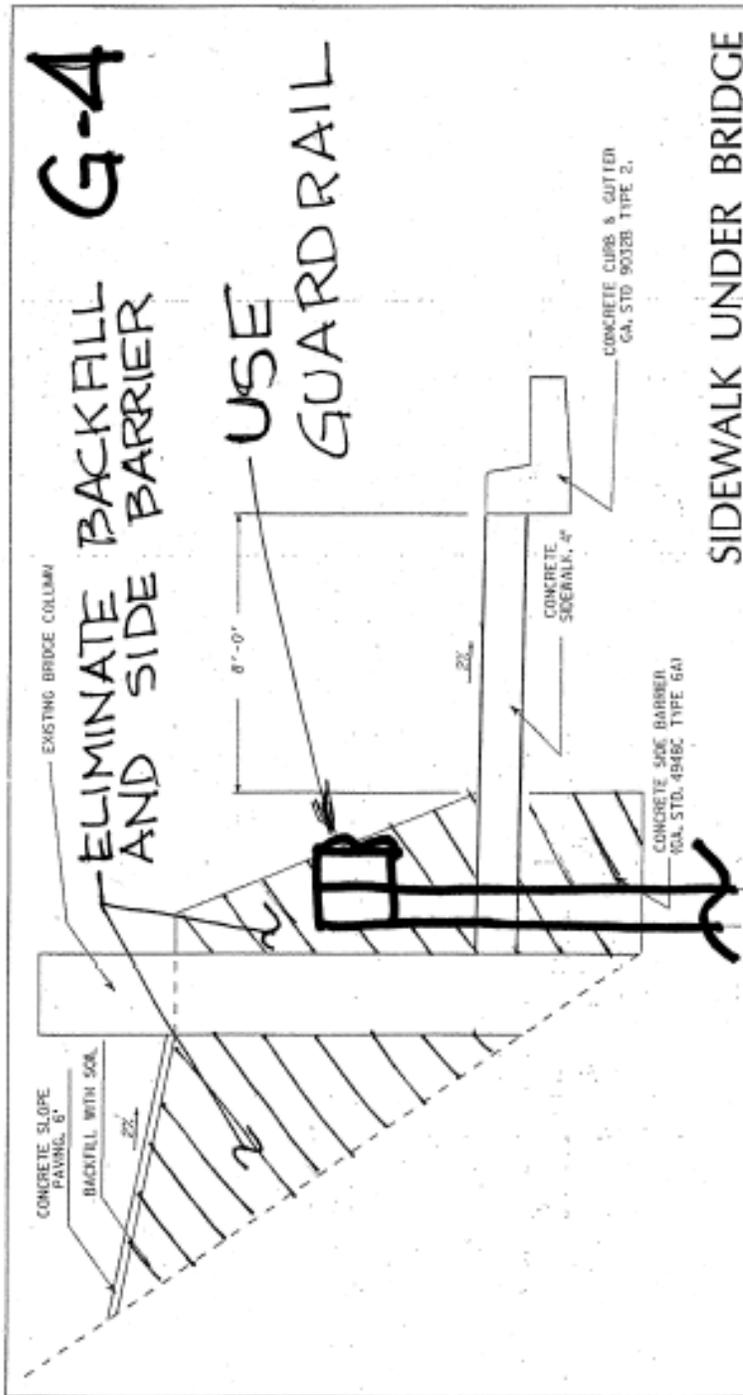
**Justification:**

The detail as proposed could have some constructability issues with compaction of fill against the existing piers and interface between the existing slope paving and new construction. An alternate design could be considered. GDOT Standard 4948 shows the concrete side barrier against the bridge piers but this detail is more suited to areas without curbing and sidewalk. Installing guard rail along the edge of the sidewalk could be considered. Also, the sidewalk width could be reduced to allow a greater separation between the guardrail and the columns.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	116,000		
<b>- Proposed</b>	5,000		
<b>- Savings</b>	111,000		111,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>111,000</b>

SR 300/Clark Ave. and Interchange Improvements

ITEM N<sup>o</sup>: G-4  
CLIENT: GDOT  
Sheet 2 of 3



**COST WORKSHEET**

<b>PROJECT: SR 300/SR520/Clark Ave. between Turner Field and SR 62 and SR 3 @ Clark Ave.Ramp</b>	ITEM No: G-4 CLIENT: GDOT Sheet 3 of 3
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CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Concrete side barrier	LF	278	375.00	104,250			
Slope paving	SY	150	30.00	4,500			
Backfill / embankment	CY	200	8.00	1,600			
Guardrail	LF				278	16.98	4,720
<b>SUBTOTAL</b>				110,350			4,720
Markup	5.00%			5,518			236
<b>TOTAL</b>				115,868			4,956
<b>TOTAL ROUNDED</b>				116,000			5,000

**APPENDIX**





## INFORMATION PHASE ----- FUNCTION ANALYSIS

### SR 300 / SR 520 Clark Avenue and Interchange Ramp Improvements

**System:** Expand Roadway  
**Function:** Improve traffic flow

ITEM No.	DESCRIPTION	FUNCTION			INITIAL DOLLARS ( x 1,000 )		
		Verb	Noun	Kind*	Cost	% of Total	Worth
A	Asphalt Cement Pavement	Supports	Traffic	S	4,504	24	3,000
		Adds	Capacity	B			
B	Right of way	Store	Project	S	4,439	24	4,200
C	Aggregate Base	Support	Median	S	3,594	19	1,900
		Support	Pavement	B			
D	Storm Drainage	Divert	Storm water	S	1,647	9	1,500
		Retain	Storm water	S			
E	Concrete Median	Separate	Traffic	S	760	4	600
F	Grading	Achieve	Grade	B	669	4	600
		Store	Storm water	S			
G	Concrete Sidewalk	Hold	Pedestrians	S	637	3	500
<b>TOTAL</b>					<b>16,250</b>	<b>87</b>	<b>12,300</b>

\* B = Basic, S = Secondary

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
<b>SR 300 / SR 520 Clark Avenue and Interchange Ramp Improvements</b>			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
<b>A</b>	<b>AC Pavement</b>		
A-1	Reuse existing pavement		√
A-1.1	Reuse existing pavement on Cordele		√
A-2	Remove full depth pavement under median		√
A-3	Use 10 foot lanes for staging	Too narrow for amount of trucks	<b>X</b>
A-4	Reduce depth of pavement on ramp shoulders		√
A-5	Verify length of right turn lanes		√
A-6	Shorten limits on Cordele		√
A-7	Revise pavement section on side roads		√
A-8	Shorten limits on ramps	Not feasible for any major savings	<b>X</b>
A-9	Use a narrower shoulder on ramps	Not an ideal way to go	<b>X</b>
A-10	Evaluate pavement design for temporary pavement	Does not comply with AASHTO guidance	<b>X</b>
<b>B</b>	<b>Right of Way</b>		
B-1	Use 12 foot shoulder in lieu of 16 foot		√
B-2	Evaluate 2:1 shoulder slope for clear zone requirements		<b>DC</b>
B-3	Relocate WB road north to minimize impacts on residential south side.		√

\*\* √ = Idea will be evaluated; X= idea will be dropped; DC = Design Consideration – presented for consideration by the design team

NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
B-4	Switch WB road north , use wall around the water tank to minimize impacts		√
B-5	Maximize temporary ROW easements	Requires additional information	√
B-6	Use a rural section on the north side		√
<b>C</b>	<b>Granular Aggregate Base</b>		
C-1	Increase thickness in temporary areas and reduce the thickness of the pavement	Pavement design should be the same	<b>X</b>
C-2	Reduce the thickness in the median and under curb and gutter		<b>See C-3</b>
C-3	Eliminate 6 inch extension under curb and gutter		√
<b>D</b>	<b>Storm Drainage</b>		
D-1	Economize layout		√
D-2	Use roadside ditches in lieu of ponds		√
D-3	Use pipes for storage Cordele	Not feasible	<b>X</b>
D-4	Use modified rural section in select areas		√
<b>E</b>	<b>Concrete Median</b>		
E-1	Reduce median width from 16 foot		√
E-2	Use a grass median and reduce length of left turn lane		√
E-3	Use a double yellow line to divide traffic		<b>X</b>

\*\* √ = Idea will be evaluated; X= idea will be dropped; DC= Design Consideration – presented for consideration by the design team

NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
<b>F</b>	<b>Grading</b>		
F-1	Optimize design of profile		DC
<b>G</b>	<b>Sidewalk</b>		
G-1	Eliminate north side sidewalk from ramp to Cordele Road		√
G-2	Use asphalt sidewalk in lieu of concrete		√
G-3	Use gravel path in lieu of sidewalk	Will be more maintenance	X
G-4	Reduce sidewalk width under bridge		√

\*\* √ = Idea will be evaluated; X= idea will be dropped; DC= Design Consideration – presented for consideration by the design team





### VE STUDY SIGN-IN SHEET

Project No.: STP00-0002-00(409)  
 Days NH000-0006-02(056)

County: Dougherty

PI No.: 0002409  
 422560-

Date: November 1 - 4, 2010

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				<del>Construction</del>	<del>404-631-1971</del>	<del>jmagruse@dot.ga.gov</del>
✓		Ken Werho		Traffic Operations	404-635-8144	kwerho@dot.ga.gov
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✓		Amber Phillips		Environment	4) 631-1117	aphillips@dot.ga.gov

Check all that attend     
 22 Attended Project Overview (Day 1)     
 10 Attended Project Presentation (Day 4)  
9 VIA VIDEO

