

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
REVISED PROJECT CONCEPT REPORT**

Project Type: <u>Widening</u>	P.I. Number: <u>220680-</u>
GDOT District: <u>2</u>	County: <u>Richmond</u>
Federal Route Number: <u>N/A</u>	State Route Number: <u>4</u>
Project Number: <u>STP00-043-01(057)</u>	

In accordance with the Augusta Sustainable Development Implementation Plan, a typical section is proposed from Milledgeville Rd to 15th Ave that replaces the shared use path with 5-foot wide sidewalks and 5-foot wide bike lanes and 10-foot wide shoulders, and revises the curb and gutter to header curb on both sides of the road. The proposed median is changed from 18-foot wide to a 16-foot wide. On SR 4/15th Street the proposed typical section replaces the shared use path with 5-foot sidewalks and 5-foot bike lanes with 10-foot shoulders in addition to the use of header curb in lieu of curb and gutter on both sides of the roadway.

Submitted for approval:

C. Andy Cury 11/20/15
GDOT Roadway Design Office DATE

Albert Shelby 12/2/15
State Program Delivery Engineer DATE

Mahell Sp 11/30/15
GDOT Project Manager DATE

Recommendation for approval:

ERIC DUFF*/EKP 1/29/2016
State Environmental Administrator DATE

KEN WERHO*/EKP 1/21/2016
FOR State Traffic Engineer DATE

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

CINDY VAN DYKE*/EKP 1/21/2016
State Transportation Planning Administrator DATE

**- RECOMMENDATION ON FILE*

PLANNING, APPROVED CONCEPT, AND BACKGROUND

Project STP00-0043-01(057) or PI No. 220680 is located along SR 4 within the City of Augusta and Richmond County, Georgia. The proposed improvements for PI No. 220680 entail the widening and installation of raised median along SR 4 from M.L. King Jr. Blvd to Government Street. The project also will construct a raised median on the existing four lane section of SR 4 from Milledgeville Road to 15th Street. The Preliminary engineering phase of this project PI No.220680 was authorized in 1992 and in 1997. The Right of Way phase is scheduled for 2015 and long range, and the construction phase is long range.

In October 1982 the widening of SR 4 was added to the Augusta Regional Transportation Study's (ARTS) Long Range Transportation Plan by the ARTS Policy Committee. The project, justified based on traffic volumes and travel demand model runs, was added to the ARTS Transportation Improvement Program in the late-1980s and Preliminary Engineering began in the early-1990s. The project also became classified as partially funded by the Transportation Improvement Act (TIA) in 2012.

Josey High School is the major activity center and traffic generator located on the eastern end of the project on SR 4 near Eagles Way. Local officials have expressed that this school zone is causing a congestion problem along this section of two-lane road during AM/PM peak hours. State Route 4 is currently a two lane facility in front of Josey High School and does not have Left or Right turn lanes.

The improved facility will be multi-modal in nature. During the design phase in 2007, meetings were held with local stakeholders to discuss potential improvements for PI 220680. The stakeholders involved members of the local community to discuss potential intersection improvements and additional multi-modal improvements. Pedestrians, motorists, transit users, bicyclists, and others will benefit by the upgraded SR 4. The reconstructed SR 4 will improve access to and from the Augusta Medical Center, downtown Augusta, employment centers, residences, schools, churches and community gathering places.

The funneling effect of traffic on this section of SR 4 / M.L. King Jr. Blvd. (between Milledgeville Road and 15th Street) exacerbates the already challenging operational conditions along SR 4 associated with numerous curb cuts. The Planning process envisions these operational challenges can be alleviated or lessened with the construction of a raised median. The western end of the median installation at Milledgeville Road is logical to address the operational issues concerning left turn movements that are magnified by the funneling effect of traffic traveling westbound. The eastern end of the median installation at Government Street is logical to address the operational and capacity issues concerning left turn movements along the corridor up to Government Street.

Existing conditions:

State Route 4 runs in a north-south direction through the center of Augusta, GA. The speed limit along SR 4 is 40 mph from Milledgeville Road to Wooten Road and is 35 mph from Wooten Road to Government Street. State Route 4 is a four lane road with 12 foot lanes with a 14 foot center turn lane from Milledgeville Road to Wooten Road. State Route 4 is a two lane road with 12 foot lanes from Wooten Road to Government Street. The functional classification for SR 4 throughout the corridor is an Urban Principal Arterial. Martin Luther King Jr. Blvd and 15th Avenue east of the

project corridor is classified as an Urban Minor Arterial. Milledgeville Road west of the project corridor is also classified as an Urban Minor Arterial. Olive Road and Sunset Avenue crossing the project corridor are classified as an Urban Collector Streets. The percentage of trucks along the bypass corridor is estimated at 12%.

Description of the approved concept:

The original Concept Report was approved on October 25, 2004 and a Revised Concept Report was approved on July 7, 2008.

SR 4/Milledgeville Rd. /MLK Blvd.:

The approved typical section is 4-11foot travel lanes, two in each direction, and an 18-foot raised median with a 12-foot left turn lane at median openings. From Milledgeville Road to Olive Road, the roadway will have a 12-foot shoulder with a 5-foot sidewalk and curb and gutter on both sides of the roadway. Existing curb and gutter and sidewalk is to be maintained wherever possible from Milledgeville Road to Olive Road. From Olive Road to 15th Avenue, the roadway will have a 14-foot shoulder with an 8-foot sidewalk and curb and gutter on the west side of the roadway and a 12-foot shoulder with a 5-foot sidewalk and curb and gutter on east side of the roadway.

SR 4/15th Street Section:

The approved typical section is 4-11foot travel lanes, two in each direction, and a 16-foot raised median with a 12-foot left turn lane at median openings, a 15-foot shoulder with an 8-foot sidewalk and curb and gutter on the west side of the roadway and a 12-foot shoulder with a 5-foot sidewalk on east side of the roadway.

Federal Oversight: Full Oversight Exempt State Funded Other

Projected Traffic as shown in the approved Concept Report: ADT or AADT

Open Year (2010): 33,525

Design Year (2030): 44,950

Updated Traffic: ADT or AADT

Open Year (2020): 23,400

Design Year (2040): 26,900

Functional Classification (Mainline): Urban Principal Arterial

VE Study anticipated: No Yes Completed – Date: 2008

PROPOSED REVISIONS

Approved Features:	Proposed Features:
<p>SR 4/Milledgeville Rd./MLK Blvd.:</p> <ul style="list-style-type: none"> Approved typical section(s): 4-11foot travel lanes, two in each direction, and an 18-foot raised median with a 12-foot left turn lane at median openings. From Milledgeville Road to Olive Road, the roadway will have a 12-foot shoulder with a 5-foot sidewalk and curb and gutter on both sides of the roadway. Existing curb and gutter and sidewalk to be maintained wherever possible from Milledgeville Road to Olive Road. From Olive Road to 15th Avenue, the road will have a 14-foot shoulder with an 8-foot shared use path and curb and gutter on west side of roadway and a 12-foot shoulder with a 5-foot sidewalk and curb and gutter on east side of roadway. <p>SR 4/15th Street Section:</p> <ul style="list-style-type: none"> Approved typical section(s): 4-11foot travel lanes, two in each direction, and a 16-foot raised median with a 12-foot left turn lane at median openings, a 15-foot shoulder with an 8-foot shared use path and curb and gutter on west side of roadway and a 12-foot shoulder with a 5-foot sidewalk on east side of roadway. 	<p>SR 4/Milledgeville Rd./MLK Blvd.:</p> <ul style="list-style-type: none"> 10-foot shoulder with a 5-foot sidewalk and header curb on both sides of the roadway with 16-foot raised median. Typical section will also include a 5-foot bike lane on both sides of the roadway. <p>SR 4/15th Street Section:</p> <ul style="list-style-type: none"> 10-foot shoulder with a 5-foot sidewalk and header curb on both sides of the roadway with 16-foot raised median. Typical section will also include a 5-foot bike lane on both sides of the roadway.
<p>Reason(s) for change: The above changes are proposed to be in accordance with the Augusta Sustainable Development Implementation Plan</p>	

Design Variances and/or Exceptions needed:

- Substandard horizontal curve length on Milledgeville Rd Essie McIntyre Blvd., and Emory St- Approved ~~November 8, 2010~~ 1/10/2011 (ERP)
- Substandard radius of curvature on Milledgeville Rd and Emory St - Approved ~~November 8, 2010~~ 1/10/2011 (ERP)
- Substandard Superelevation on Milledgeville Rd- Approved ~~November 8, 2010~~ 1/10/2011 (ERP)
- Skew Angle at Intersection of Martin Luther King Jr. Blvd. and SR/15th Street- Approved ~~November 8, 2010~~ 1/10/2011 (ERP)
- Substandard median width throughout the project-Approved November 8, 2010

(Design Variance: 18ft and 16ft) (ERP)

ENVIRONMENTAL AND PERMITS

Potential environmental impacts of proposed revision: No anticipated environmental effects; Additional stream impacts; etc.). Anticipated effects to the project schedule are estimated to be approximately 12 months.

Have proposed revisions been reviewed by environmental staff? No Yes

Environmental responsibilities (Studies/Documents/Permits): Jacobs Engineering has been consulted for the task of preparing the Environmental Document.

Air Quality:

Is the project located in a PM 2.5 Non-attainment area? No Yes
 Is the project located in an Ozone Non-attainment area? No Yes
 Is a Carbon Monoxide hotspot analysis required? No Yes

PROJECT COST AND ADDITIONAL INFORMATION

Item	Estimated Cost	Date of Estimate	Funded By
Base Construction Cost:	\$8,725,925.78	3/3/2016	
Contingency:	\$872,592.58	3/3/2016	
Engineering and Inspection:	\$436,296.29	3/3/2016	
Liquid AC Adjustment:	\$458,865.15	11/19/2015	
<u>Total Construction Cost:</u>	\$10,493,679.80		
Right-of-Way:	\$13,704,000	2/3/2016	
Utilities (reimbursable costs):	\$1,913,448 \$529,660	3/28/2016	
Environmental Mitigation:	N/A		
TOTAL PROJECT COST:	\$26,111,128 \$29,526,680		

Recommendation: It is the recommendation of this office that the proposed revisions to the concept be approved for implementation.

Comments: None

Attachments:

1. Sketch map
2. Cost Estimate(s)
3. Typical Section
4. VE Implementation Letter
5. Letter of Reversal for Design Changes
6. Letter from Augusta-Richmond County Planning Commission
7. Response to Augusta-Richmond County Planning Commission
8. Design Exceptions/Variance
9. Design Traffic Counts

APPROVALS

Concur: *Paul Pettit*
Director of Engineering

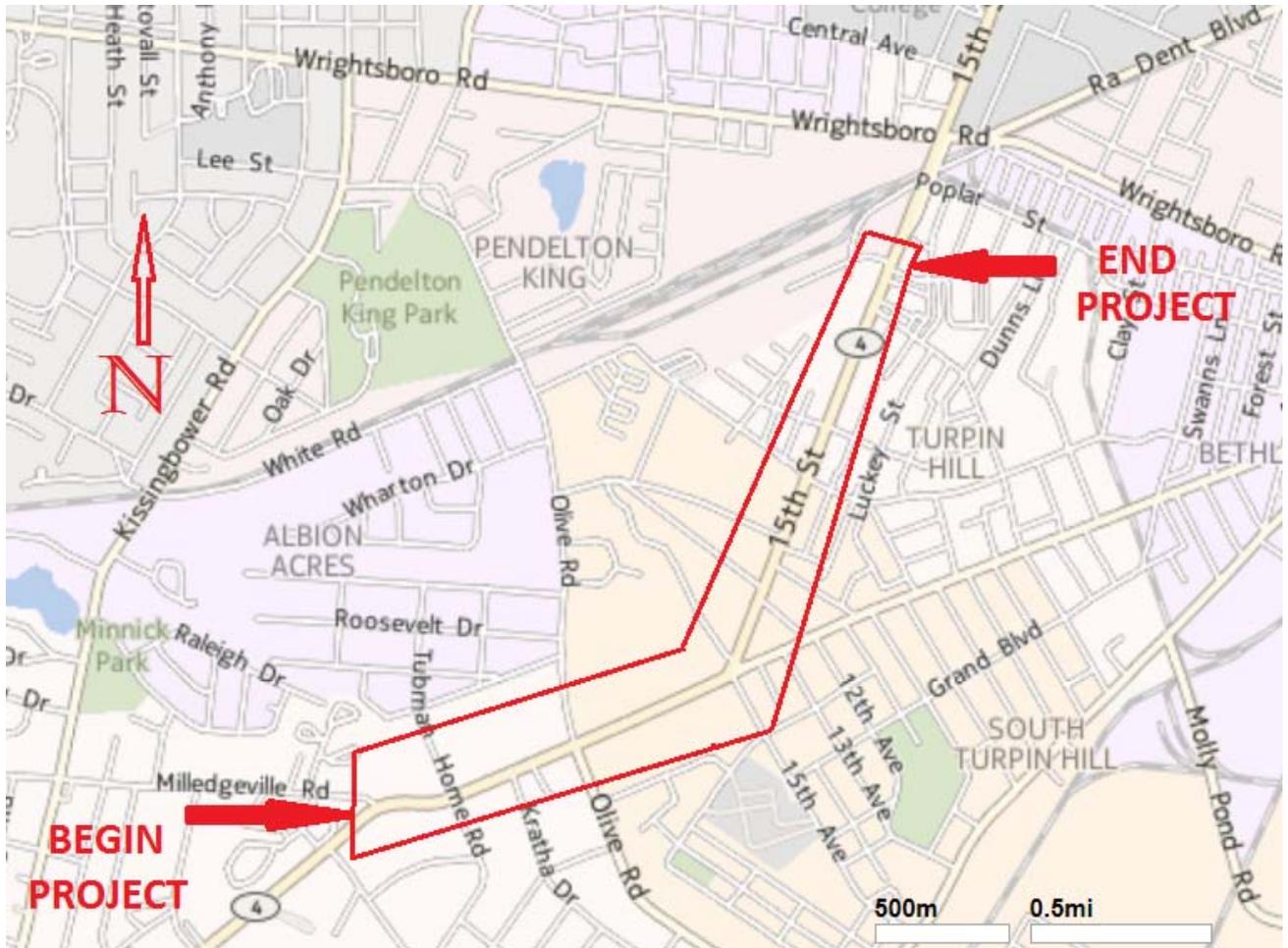
Approve: *Margaret B. Pivels*
Chief Engineer

4.22.16
Date

SR 4 Improvements from Milledgeville Road to Government Road

Project STP00-0043-01(057) PI No. 220680

Project Sketch Map



DETAILED COST ESTIMATE



Job: 220680-

JOB NUMBER 220680-

FED/STATE PROJECT NUMBER STP00-0043-01(057)

SPEC YEAR: 13

DESCRIPTION: SR4/15TH STREET FROM MILLEDGVILLE RD TO GOVERNMENT STR

ITEMS FOR JOB 220680-

0010 - ROADWAY

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0370	150-1000	1.000	LS	\$650,000.00000	TRAFFIC CONTROL - STP00-0043-01(057)	\$650,000.00
0010	153-1300	1.000	EA	\$64,862.35333	FIELD ENGINEERS OFFICE TP 3	\$64,862.35
0375	210-0100	1.000	LS	\$2,250,000.00000	GRADING COMPLETE - STP00-0043-01(057)	\$2,250,000.00
0020	310-1101	39200.000	TN	\$13.99283	GR AGGR BASE CRS, INCL MATL	\$548,518.94
0025	318-3000	250.000	TN	\$21.21212	AGGR SURF CRS	\$5,303.03
0034	402-1812	350.000	TN	\$78.27443	RECYL AC LEVELING, INC BM&HL	\$27,396.05
0035	402-3121	21640.000	TN	\$58.76814	RECYL AC 25MM SP, GP1/2, BM&HL	\$1,271,742.55
0040	402-3130	9392.000	TN	\$63.22018	RECYL AC 12.5MM SP, GP2, BM&HL	\$593,763.93
0045	402-3190	6950.000	TN	\$66.91788	RECYL AC 19 MM SP, GP 1 OR 2 , INC BM&HL	\$465,079.27
0385	413-0750	10325.000	GL	\$2.85513	TACK COAT	\$29,479.22
0055	432-5010	51050.000	SY	\$1.56895	MILL ASPH CONC PVMT, VARB DEPTH	\$80,094.90
0079	441-0018	61.000	SY	\$46.78000	DRIVEWAY CONCRETE, 8 IN TK	\$2,853.58
0060	441-0104	11224.000	SY	\$24.85559	CONC SIDEWALK, 4 IN	\$278,979.14
0260	441-0754	1176.000	SY	\$43.75333	CONC MEDIAN, 7 1/2 IN	\$51,453.92
0070	441-4020	576.000	SY	\$34.76280	CONC VALLEY GUTTER, 6 IN	\$20,023.37
0075	441-4030	752.000	SY	\$29.37000	CONC VALLEY GUTTER, 8 IN	\$22,086.24
0085	441-5002	15780.000	LF	\$11.29933	CONC HEADER CURB, 6, TP 2	\$178,303.43
0090	441-6222	6078.000	LF	\$16.11511	CONC CURB & GUTTER/ 8X30TP2	\$97,947.64
0100	441-6740	8464.000	LF	\$10.36146	CONC CURB & GUTTER/ 8X30 TP7	\$87,699.40
0105	446-1100	7400.000	LF	\$2.66546	PVMT REF FAB STRIPS, TP2, 18 INCH WIDTH	\$19,724.40
0110	500-9999	305.000	CY	\$165.79253	CL B CONC, BASE OR PVMT WIDEN	\$50,566.72
0270	620-0100	600.000	LF	\$24.64569	TEMP BARRIER, METHOD NO. 1	\$14,787.41
0115	634-1200	324.000	EA	\$80.52445	RIGHT OF WAY MARKERS	\$26,089.92
SUBTOTAL FOR ROADWAY:						\$6,836,755.41

0020 - SECTION DRAINAGE

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0120	550-1180	5745.000	LF	\$28.54647	STM DR PIPE 18, H 1-10	\$163,999.47
0125	550-1240	2480.000	LF	\$30.79754	STM DR PIPE 24, H 1-10	\$76,377.90
0130	550-1241	1400.000	LF	\$61.59018	STM DR PIPE 24, H 10-15	\$86,226.25
0135	550-1301	2700.000	LF	\$48.69138	STM DR PIPE 30, H 10-15	\$131,466.73
0140	550-1361	2000.000	LF	\$63.68324	STM DR PIPE 36, H 10-15	\$127,366.48
0145	550-1421	2450.000	LF	\$85.72504	STM DR PIPE 42, H 10-15	\$210,026.35
0150	668-1100	17.000	EA	\$1,877.33333	CATCH BASIN, GP 1	\$31,914.67
0155	668-1110	270.000	LF	\$169.50025	CATCH BASIN, GP 1, ADDL DEPTH	\$45,765.07
0265	668-1200	12.000	EA	\$2,222.30000	CATCH BASIN, GP 2	\$26,667.60
0160	668-2100	400.000	EA	\$1,675.16667	DROP INLET, GP 1	\$670,066.67
0165	668-4300	8.000	EA	\$1,868.16667	STORM SEW MANHOLE, TP 1	\$14,945.33
SUBTOTAL FOR SECTION DRAINAGE:						\$1,584,822.52

DETAILED COST ESTIMATE



Job: 220680-

0030 - TEMPORARY EROSION CONTROL

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0170	163-0232	7.000	AC	\$112.01614	TEMPORARY GRASSING	\$784.11
0175	163-0240	19.500	TN	\$227.46909	MULCH	\$4,435.65
0195	163-0300	12.000	EA	\$1,409.56091	CONSTRUCTION EXIT	\$16,914.73
0200	163-0550	300.000	EA	\$138.94427	CONS & REM INLET SEDIMENT TRAP	\$41,683.28
0205	165-0010	28000.000	LF	\$0.35961	MAINT OF TEMP SILT FENCE, TP A	\$10,069.08
0210	165-0101	12.000	EA	\$375.78945	MAINT OF CONST EXIT	\$4,509.47
0215	165-0105	300.000	EA	\$51.98751	MAINT OF INLET SEDIMENT TRAP	\$15,596.25
0220	167-1000	2.000	EA	\$331.91157	WATER QUALITY MONITORING AND SAMPLING	\$663.82
0225	167-1500	24.000	MO	\$633.72301	WATER QUALITY INSPECTIONS	\$15,209.35
0230	171-0010	14000.000	LF	\$1.64986	TEMPORARY SILT FENCE, TYPE A	\$23,098.04
0080	643-8200	3477.000	LF	\$1.79523	BARRIER FENCE (ORANGE), 4 FT	\$6,242.01
0180	700-7000	24.000	TN	\$26.59817	AGRICULTURAL LIME	\$638.36
0185	700-8000	8.000	TN	\$456.91616	FERTILIZER MIXED GRADE	\$3,655.33
0190	700-8100	400.000	LB	\$2.46198	FERTILIZER NITROGEN CONTENT	\$984.79
SUBTOTAL FOR TEMPORARY EROSION CONTROL:						\$144,484.27

0040 - PERMANENT EROSION CONTROL

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0255	163-0240	39.000	TN	\$212.76097	MULCH	\$8,297.68
0380	603-2024	200.000	SY	\$40.49000	STN DUMPED RIP RAP, TP 1, 24	\$8,098.00
0235	700-6910	14.000	AC	\$456.58558	PERMANENT GRASSING	\$6,392.20
0240	700-7000	42.000	TN	\$33.56284	AGRICULTURAL LIME	\$1,409.64
0245	700-8000	13.000	TN	\$454.73621	FERTILIZER MIXED GRADE	\$5,911.57
0250	700-8100	700.000	LB	\$2.39710	FERTILIZER NITROGEN CONTENT	\$1,677.97
SUBTOTAL FOR PERMANENT EROSION CONTROL:						\$31,787.06

0050 - SIGNING & MARKING

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0355	636-1020	58.500	SF	\$11.05000	HWY SGN,TP1MAT,REFL SH TP3	\$646.43
0360	636-1033	280.590	SF	\$17.60330	HWY SIGNS, TP1MAT,REFL SH TP 9	\$4,939.31
0365	636-2070	613.000	LF	\$6.57617	GALV STEEL POSTS, TP 7	\$4,031.19
0275	636-5100	2.000	EA	\$200.00000	MILEPOST SIGNS	\$400.00
0315	653-0110	3.000	EA	\$67.21080	THERM PVMT MARK, ARROW, TP 1	\$201.63
0310	653-0120	78.000	EA	\$70.79150	THERM PVMT MARK, ARROW, TP 2	\$5,521.74
0320	653-0130	5.000	EA	\$104.22500	THERM PVMT MARK, ARROW, TP 3	\$521.13
0325	653-0160	4.000	EA	\$89.33333	THERM PVMT MARK, ARROW, TP 6	\$357.33
0330	653-0170	8.000	EA	\$82.79459	THERM PVMT MARK, ARROW, TP 7	\$662.36
0335	653-0210	11.000	EA	\$100.52767	THERM PVMT MARK, WORD , TP 1	\$1,105.80
0295	653-1501	33100.000	LF	\$0.28020	THERMO SOLID TRAF ST 5 IN, WHI	\$9,274.62
0280	653-1502	25120.000	LF	\$0.27873	THERMO SOLID TRAF ST, 5 IN YEL	\$7,001.70
0345	653-1704	1730.000	LF	\$3.03774	THERM SOLID TRAF STRIPE,24,WH	\$5,255.29
0340	653-1804	6150.000	LF	\$1.61498	THERM SOLID TRAF STRIPE, 8,WH	\$9,932.13
0305	653-3501	23550.000	GLF	\$0.16175	THERMO SKIP TRAF ST, 5 IN, WHI	\$3,809.21
0290	653-3502	570.000	GLF	\$0.20000	THERMO SKIP TRAF ST, 5 IN, YEL	\$114.00
0350	653-6006	405.000	SY	\$3.02208	THERM TRAF STRIPING, YELLOW	\$1,223.94
0285	654-1001	128.000	EA	\$3.67897	RAISED PVMT MARKERS TP 1	\$470.91
0300	654-1003	780.000	EA	\$2.83866	RAISED PVMT MARKERS TP 3	\$2,214.15
SUBTOTAL FOR SIGNING & MARKING:						\$57,882.87

DETAILED COST ESTIMATE



Job: 220680-

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0074	441-0748	2634.000	SY	\$26.72500	CONC MEDIAN, 6 IN	\$70,393.65
SUBTOTAL FOR :						\$70,393.65

TOTALS FOR JOB 220680-

ITEMS COST:	\$8,725,925.78
COST GROUP COST:	\$0.00
ESTIMATED COST:	\$8,725,925.78
CONTINGENCY PERCENT:	0.10
ENGINEERING AND INSPECTION:	0.05
ESTIMATED COST WITH CONTINGENCY AND E&I:	\$10,034,814.65

PROJ. NO. STP00-0043-01(057)
P.I. NO. 220680
DATE 3/3/2016

CALL NO.

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Mar-16	\$ 1.671
DIESEL		\$ 2.009
LIQUID AC		\$ 391.00

Link to Fuel and AC Index:
<http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx>

LIQUID AC ADJUSTMENTS

$PA = ((APM - APL) / APL) \times TMT \times APL$

Asphalt

Price Adjustment (PA)				448461.36	\$	448,461.36
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	625.60		
Monthly Asphalt Cement Price month project let (APL)			\$	391.00		
Total Monthly Tonnage of asphalt cement (TMT)				1911.6		

ASPHALT	Tons	%AC	AC ton
Leveling	350	5.0%	17.5
12.5 OGFC		5.0%	0
12.5 mm	9292	5.0%	464.6
9.5 mm SP		5.0%	0
25 mm SP	21640	5.0%	1082
19 mm SP	6950	5.0%	347.5
	38232		1911.6

BITUMINOUS TACK COAT

Price Adjustment (PA)			\$	10,403.79	\$	10,403.79
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	625.60		
Monthly Asphalt Cement Price month project let (APL)			\$	391.00		
Total Monthly Tonnage of asphalt cement (TMT)				44.34691702		

Bitum Tack

Gals	gals/ton	tons
10325	232.8234	44.346917

PROJ. NO.
P.I. NO.
DATE

STP00-0043-01(057)
220680
3/3/2016

CALL NO.

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)					0	\$	-
Monthly Asphalt Cement Price month placed (APM)		Max. Cap	60%	\$	625.60		
Monthly Asphalt Cement Price month project let (APL)				\$	391.00		
Total Monthly Tonnage of asphalt cement (TMT)					0		

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT						\$	458,865.15
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**GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY**

Date: 2/3/2016 Project: STP-043-1(57)
 Revised: County: Richmond
 PI: 220680

Description: SR 4/15th Street from Milledgeville to Government Street
 Project Termini: SR 4/15th Street from Milledgeville to Government Street

Existing ROW:
 Required ROW:
 Parcels: 205

Land and Improvements _____ \$8,234,925.00

Proximity Damage	\$450,000.00
Consequential Damage	\$200,000.00
Cost to Cures	\$100,000.00
Trade Fixtures	\$250,000.00
Improvements	\$2,525,000.00

Valuation Services _____ \$950,000.00

Legal Services _____ \$1,300,875.00

Relocation _____ \$1,050,000.00

Demolition _____ \$395,000.00

Administrative _____ \$1,772,500.00

TOTAL ESTIMATED COSTS _____ \$13,703,300.00

TOTAL ESTIMATED COSTS (ROUNDED) _____ \$13,704,000.00

Preparation Credits	Hours	Signature

Prepared By: Dashone Alexander CG#: 286999 02/03/2016 (DATE)
 Approved By: Dashone Alexander CG#: 286999 02/03/2016 (DATE)

NOTE: No Market Appreciation is included in this Preliminary Cost Estimate

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE

Project No: STP00-0043-01(057)
 County: RICHMOND
 P.I. #: 220680

Office: Tennille
 Date: March 28, 2016

Description: *SR 4 From Milledgeville Rd to Government St*

FROM James L. Lindsey, District Utilities Engineer

TO Marshall Troup, Project Manager

SUBJECT PRELIMINARY UTILITY COST ESTIMATE

A review of utilities located on the above referenced project has been conducted based on the latest available plans. Listed below is a breakdown of the anticipated reimbursable and non-reimbursable cost.

<u>Utility Owner</u>	<u>Reimbursable</u>	<u>Non-Reimbursable</u>	<u>Estimate Based on</u>
Georgia Power Co. (D)	\$329,000.00	\$0.00	Site Visit / Available Drawings
AT&T Georgia	\$0.00	\$250,000.00	Per AT&T
AGL Resources	\$0.00	\$264,064.00	Available Drawings
Augusta Utilities Dept. (water)	\$0.00	\$588,854.00	Site Visit / Available Drawings
Augusta Utilities Dept. (sewer)	\$0.00	\$420,530.00	Site Visit / Available Drawings
Comcast Cable	\$0.00	\$97,500.00	Site Visit / Available Drawings
WOW	\$0.00	\$292,500.00	Site Visit / Available Drawings
	\$0.00	\$0.00	
	\$0.00	\$0.00	
	\$0.00	\$0.00	
	\$0.00	\$0.00	
Total 100.00%	\$329,000.00	\$1,913,448.00	
Department Responsibility 100.00%	\$329,000.00	\$1,913,448.00	
Local Sponsor Responsibility 0.00%	\$ 0.00	\$ 0.00	PFA Dated N/A with N/A

Update All

** Indicates Potential Utility Aid Request from Local Gov't

Estimate is based on the best available information at the current stage, unforeseen prior rights information may be provided by the Utility Company at a later date that could cause some non-reimbursable costs to shift to the reimbursable cost column.

If additional information is needed, please contact Caleb G. Lord at (478) 553-3384 or by email at clord@dot.ga.gov.

cc: Robert Elam, Designer – via e-mail
 Lee Upkins, State Utilities Office – via e-mail
 Yulonda Pride-Foster, State Utilities Preconstruction Engineer – via e-mail

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: STP-043-1(57) Richmond
P.I. No. 220680
S.R. 4/15th Street Widening/Reconstruction

OFFICE: Engineering Services

DATE: June 8, 2007

FROM: Brian K. Summers, PE, Project Review Engineer

TO: Ben Buchan, P.E., State Urban Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate the VE alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT #	Description	Potential Savings/LCC	Implement	Comments
1	Use an 8-foot wide multiuse lane on the west side and a 5-foot wide sidewalk on the east side of the project from Olive Rd. to Government Street	\$470,818	Yes	This should be done.
4	Use 5-foot wide sidewalks throughout the project	\$488,424	No	Since Alternate No. 1 is to be implemented, this VE Alternate is no longer applicable.
5	Do not construct improvements along Government Street	\$552,769	No	This work is needed to correct an existing operationally deficient intersection.
6	Selectively Barricade Side Roads	-\$145,147 (cost increase)	No	This would require that Cul-de-sacs be built which would require additional Right of Way.
8	Reduce the 12-foot wide travel lanes to 11-foot throughout	\$291,321	Yes	This should be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
9/10	Improve the horizontal alignment to allow continuous movement along S.R. 4/15 th Street	-179,113 (cost increase)	Yes	This should be done.
11	Reevaluate improvements at the southern termini of the project – Milledgeville Road/S.R. 4	\$115,989	No	Due to superelevation, the existing curb and gutter and sidewalks cannot be maintained and will need to be replaced.
12	Use common residential drives along S.R. 4/15 th Street in the proposed Historic District	\$1,207	No	The driveway locations have been placed so that they line up with existing driveways and existing garages.
13	Use an auxiliary parking lane along the proposed 15 th Street Historic District between Essie McIntyre Boulevard and the Castleberry Food's entrance	\$74,829	No	Due to the deteriorating condition of the existing pavement a new pavement section will be required.
14	Reduce the 20-foot median to 18-foot throughout the project	\$127,375	No	Since VE Alternate No. 15 will be implemented, this VE Alternate is no longer applicable.
15	Reduce the 20-foot median to 16-foot throughout the project	\$480,146	Yes	This should be done.
17	Use retaining walls to keep from impacting the YMCA complex	-\$39,899 (cost increase)	Yes	This should be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
19	Realign drainage piping at Koger Street and Koger Road	\$12,883	Yes	This should be done.
21	Eliminate the two "U" turn "Eyebrows" at Tubman Home Road	\$60,954 Proposed Cost Savings \$30,477 Revised Costs Savings	Yes	The "U" turn "Eyebrow" in the southeast quadrant will be removed. The other one will stay.
23	Do not signalize the Castleberry Food entrance	\$174,560	No	This intersection is currently signalized.
24	Use a single longitudinal drainage system versus a parallel system	Design Suggestion	Yes	This should be done.

A meeting was held on June 8, 2007 and Jill Franks of Urban Design, and Brian Summers, Ron Wishon and Lisa Myers of Engineering Services were in attendance.

The results above reflect the consensus of those in attendance and those who provided input.

Approved: signed by David E. Studstill, Jr. **Date:** June 11, 2007
David E. Studstill, Jr., P. E., Chief Engineer

BKS/REW

Attachments

- c: Gus Shanine, FHWA
- Todd Long
- Neal O'Brien, Jill Franks
- Rusty Merritt
- Richard Marshall
- Melanie Nable
- Nabil Raad
- Lisa Myers

Mr. Summers
January 16, 2008
Page 2

alternative. The Benefit-Cost ratio analysis yielded the MLK, Jr. Boulevard realignment alternative as more cost effective when compared to the CAC-developed alternative (5.30 to 4.82). However, the MLK, Jr. Boulevard realignment alternative would result in greater residential impacts than the CAC-developed alternative. The construction costs associated with extending the Oates Creek RCBC and realignment of MLK, Jr. Boulevard were not included in the cost estimate to implement the alternative. The Office of Urban Design has determined the construction costs to complete the additional work to be \$649,598. When added to the estimate to implement the alternative, the total cost of Value Engineering Alternative 9/10 totals \$828,711. Given Alternative 9/10 yields a comparable Level of Service along SR 4 at a significant cost increase, Urban Design recommends the CAC-developed alternative be approved for use in design of SR 4.

The estimated cost savings associated with Value Engineering Alternative 15 (constructing a 16-foot raised median along MLK, Jr. Boulevard and 15th Street in lieu of an 18-foot and 20-foot raised concrete median, respectively, was calculated to be \$480,146. The estimate was determined by calculating the costs associated with not constructing two feet of full-depth pavement and four feet of raised concrete median. It did not reflect the costs associated with not constructing four feet of raised concrete median along 15th Street. The design evaluated during the study proposed the section of SR 4 along MLK, Jr. Boulevard be milled and overlaid. In addition, the design of an 18-foot raised concrete median with four, 11-foot travel lanes would fit within the existing curb and gutter. Correcting the calculations, the estimated cost savings would be \$374,404. Since the portion of SR 4 along MLK, Jr. Boulevard is proposed to be milled and overlaid, and the fact that the proposed typical section of four, 11-foot travel lanes with an 18-foot raised median can be constructed within existing curb and gutter, Urban Design recommends revision (and approval) of Value Engineering Alternative 15 to include construction of four, 11-foot travel lanes and a 16-foot raised concrete median on SR 4 along 15th Street only.

CONCUR: 
Brian K. Summers, P.E., State Project Review Engineer 1/28/08
Date

APPROVAL: 
Gerald M. Ross, P.E., Chief Engineer 1/28/08
Date

JBB:CAH
Attachment

Cc: Todd Long, Nabil Rad, Lisa Meyers, Laura Rish, Richard Marshall, Rusty Merritt,
Gus Shanine, FHWA



June 14, 2013

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: STP00-0043-01 (057) Richmond County **OFFICE:** Program Delivery
P.I. No.: 220680
S.R. 4/15th St Widening **DATE:** June 14, 2013

FROM: Albert V. Shelby, State Program Delivery Engineer

TO: Lisa Myers, State Project Review Engineer

SUBJECT: RESPONSE TO VALUE ENGINEERING STUDY ALTERNATIVES

A reversal of recommendations to the Value Engineering Study is proposed for the above noted project. This office concurs with the response.

A Value Engineering Study was conducted on this project February 2007. Based on the information available at the time, alternatives were proposed which, if implemented, would reduce the overall cost of the project. Implementation of Alternates Nos. 1, 8, 9/10, 15, 17, 19, 21, and 24 was approved on June 11, 2007.

Alternative No. 1 recommended use of an 8-foot wide multiuse lane on the west side and a 5-foot wide sidewalk on the east side of the project from Olive Rd. to Government Street. The recommendation had a potential savings of \$470,818 as opposed to using an 8-foot wide multiuse path throughout.

At the request of The Augusta Sustainable Development Implementation Program (ASDIP), the Department has agreed to revise the typical section to include bike lanes in conjunction with 5-foot sidewalks on both sides of the roadway in lieu of the multiuse path.

The revised design of the sidewalks and inclusion of bike lanes would incur an addition cost of \$957,052 to the project.

If you have any questions, please contact Jeremy Busby, Project Manager at (404-631-1154).

GRS:RTE:MDR
Attn: Jeremy Busby



MEMO

To:

Jeremy T. Busby, PE
Project Manager
Georgia Department of Transportation
Office of Program Delivery
600 West Peachtree Street, 25th Floor
Atlanta, GA 30308

Copies:

Paul T. DeCamp, Jr., AICP
Steve Cassell, PE PTOE
John Paul Stout, MPA
Adam Williamson, AICP

From:

Shamir Poudel, PE
ARCADIS U.S., Inc.

Date:

February 7, 2013

ARCADIS Project No.:

GA064020

Subject:

Request for Modification to GDOT 15th Street Project (PI #220680)
Augusta Sustainable Development Implementation Program (ASDIP)

Background

The Augusta Sustainable Development Implementation Program (ASDIP) consists of four interrelated planning initiatives designed to implement sustainable development in the City of Augusta. Initiative No. 2 focuses on development of a plan and implementation program for a multimodal transportation corridor within the identified project target area, which includes the Deans Bridge Road, Martin Luther King Jr. Boulevard, and 15th Street corridors. The scope of work for Initiative No. 2 includes reviewing the current GDOT plans and coordinating with GDOT to include context-sensitive elements within the proposed footprint of the State Route 4/15th Street Road widening project (PI #220680). The desired outcome of Initiative No. 2 is a transportation improvement project that accommodates all uses (vehicles, pedestrians, bicycles, and public transit) and includes sufficient amenities.

As a part of Initiative No. 2, we have completed our review of the in-progress design plans and files dated August 2012 for the GDOT project. We have also presented the current GDOT improvement project to the public as well as the project steering committee. Based on our review, feedback from the public, input from project steering committee and input from City of Augusta, we are requesting that GDOT consider the following changes to the current project design for PI #220680.

Current GDOT Project

The State Route 4/15th Street project (PI #220680) is in the Augusta Regional Transportation Study Transportation Improvement Program (TIP) and the Georgia Statewide Transportation Improvement Program (STIP). As currently designed by GDOT, the project involves road widening and related improvements on 15th Street and Martin Luther King Jr. Boulevard from Government Road to Milledgeville Road. The current concept includes two travel lanes in each direction separated by a 15-foot to 18-foot raised median with left-turn lanes at median openings. Pedestrian components would include a 5-foot-wide sidewalk along the east side and an 8-foot shared-used path along the west side intended to provide pedestrian and bicycle accommodations. Street lighting is also included in the project.

Recommended Modifications to Current GDOT Project

Our recommendations are categorized into bicycle and pedestrian accommodations, side road alignment modifications, median modifications, and transit accommodations. Following are brief discussions of these recommendations and the rationale behind these recommendations.

Bicycle and Pedestrian Accommodations

It is our request that GDOT consider including a 5-foot bicycle lane and 5-foot sidewalk along each side of Martin Luther King Jr. Boulevard and 15th Street. Current GDOT design proposes an 8-foot path along the west side of Martin Luther King Jr. Boulevard and 15th Street to jointly accommodate pedestrian and bicycle traffic; however, the 8-foot path is too narrow to function as a two-way multi-use path. To minimize the footprint impacts associated with this change, we are proposing that the raised median along Martin Luther King Jr. Boulevard be reduced from 18 feet to 15 feet. In addition, we are proposing that a header curb be utilized along the outside instead of a 24-inch curb and gutter. An additional strip of right-of-way will be needed to accommodate these changes; however, most of the additional right-of-way need can be met by converting the proposed permanent easements to required right-of-way. See the attached typical section for the suggested dimensions. A proposed layout can be provided in Microstation and PDF formats.

Side Road Alignment Modifications

It is our request that GDOT consider modifying the current design at the intersections of:

- Essie McIntyre Boulevard and 15th Street
- Government Road and 15th Street

The current design for the Essie McIntyre Boulevard and 15th Street intersection calls for a major realignment of the western leg of the intersection to provide a perpendicular intersection between these

roads. This intersection realignment would result in significant impacts to the TW Josey High School property located in the northwest quadrant of the intersection. These impacts would affect parking spaces, internal vehicular circulation, and a fenced area beyond the parking lot. We are proposing that a less drastic realignment of Essie McIntyre Boulevard be utilized to minimize impacts to the high school. See attached layout for suggested modifications.

The current design for the Government Road and 15th Street intersection calls for a major realignment of Government Road so that it aligns with the entrance to the Cherry Tree Crossing apartments. According to a recent announcement, the housing authority of the City of Augusta is planning to demolish the existing Cherry Tree Crossing complex and redevelop it into a mixed-use development. With this redevelopment, the entrance to this property can be relocated to match the existing Government Road, eliminating the need to realign Government Road. Our preliminary discussions with the Augusta Housing Authority indicate that the Authority is open to working with GDOT on the location of the new entrance. See attached layout for suggested modifications.

Median Width and Left-Turn Bay Modifications

It is our request that GDOT consider revising the following with respect to medians:

- Length of currently proposed left-turn bays
- Width of narrowest section of median in the vicinity of left-turn lanes
- Addition of mid-block crossing

Our initial review of left-turning volumes and opposing through volumes indicates that there are opportunities to reduce the length of the left-turn bays along Martin Luther King Jr. Boulevard and 15th Street. The goal is to maximize areas along the corridor where full median width is available to install grassing, landscaping, and a mid-block crossing without compromising the operations of the intersections. We believe there are opportunities to provide wider median widths at the following locations:

- Station 108+00+/-: approximately 350 linear feet of wider median
- Station 116+00+/-: approximately 190 linear feet of wider median
- Station 133+00+/-: approximately 560 linear feet of wider median
- Station 218+00+/-: approximately 260 linear feet of wider median
- Station 230+00+/-: approximately 900 linear feet of wider median
- Station 241+00+/-: approximately 430 linear feet of wider median

The narrowest width of the median currently proposed is 1 foot in the vicinity of left-turn bays. We are proposing that this be increased to 2 feet as shown in the attached typical section to improve visibility.

Our review of the corridor indicates that an additional pedestrian crossing is needed along Martin Luther King Jr. Boulevard between the intersections of Olive Road and 15th Street. The distance between these signalized intersections with a protected pedestrian crossing opportunity is 0.3 mile. A mid-block crossing will alert motorists of the crossing and will allow pedestrians to take refuge at the median after crossing two lanes of traffic.

Transit Accommodations

Currently the City of Augusta does not operate a bus route along Martin Luther King Jr. Boulevard and 15th Street. However, it is anticipated that the City will reroute Bus Route No. 6 through Martin Luther King Jr. Boulevard and 15th Street after the GDOT widening is completed. In addition to replacing two existing bus shelters located in the vicinity of TW Josey High School, it is requested that GDOT consider including additional bus shelters at the following locations to serve the corridor with transit:

- Two bus shelters in the vicinity of TW Josey High School in addition to replacement of the two existing bus shelters. The first new shelter is proposed to serve northbound buses along 15th Street. The second new shelter is proposed to serve westbound buses along Essie McIntyre Boulevard.
- Two bus shelters (one along northbound and one along southbound Martin Luther King Jr. Boulevard) at the intersection of Milledgeville Road and Martin Luther King Jr. Boulevard to serve destinations including the YMCA, Wilkerson Gardens Elementary School, and Augusta Christian School.
- Two bus shelters at the intersection of Olive Road and Martin Luther King Jr. Boulevard (one along northbound and one along southbound Martin Luther King Jr. Boulevard) to serve the Jennings Homes housing facility and Ebenezer Seventh Day Adventist School.
- Two bus shelters at the intersection of 15th Street and Martin Luther King Jr. Boulevard (one on each side of the road) to serve residential areas in the vicinity of this major intersection.

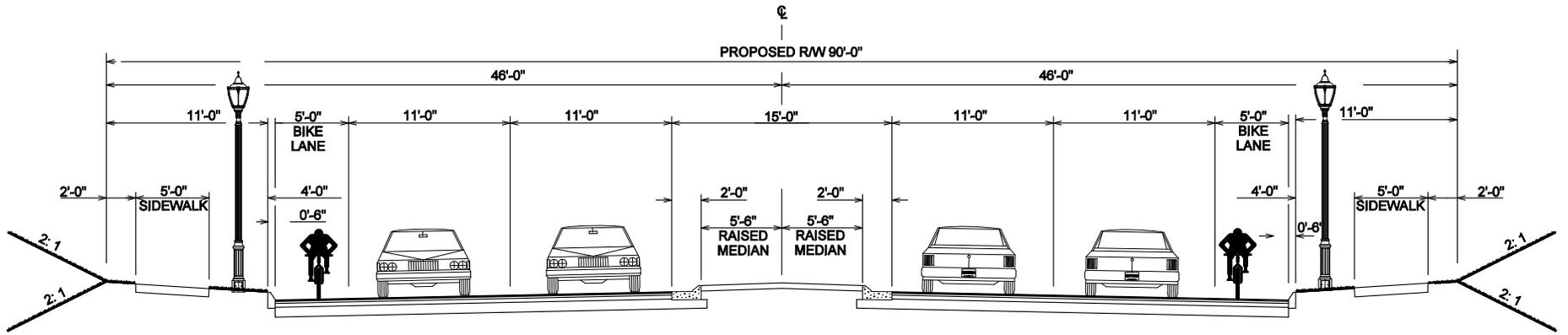
Thank you for your consideration. We would be happy to meet with you to discuss these recommendations.

Attachments:

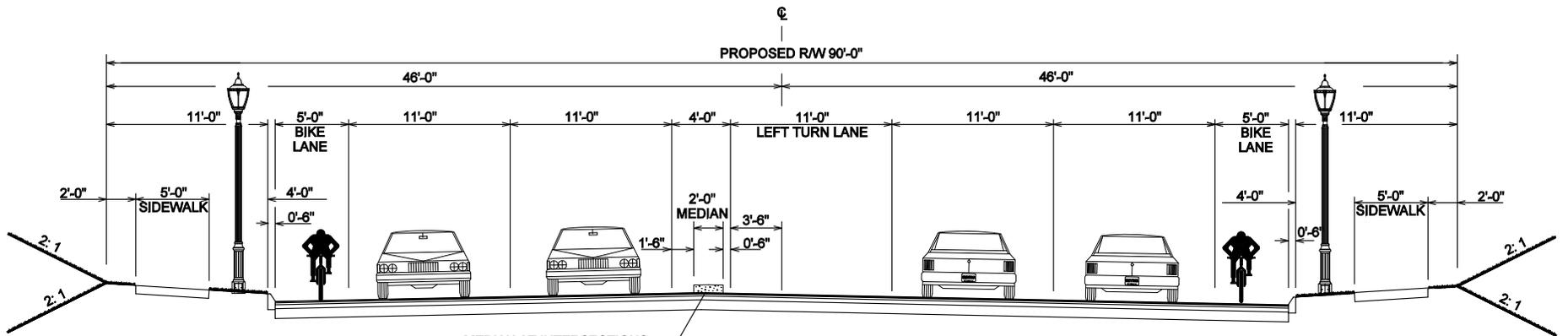
Revised Typical Section

Intersection Layouts

Microstation and PDF Concepts (not attached but available if needed)



15th STREET & MARTIN LUTHER KING JR BLVD
 PROPOSED TYPICAL SECTION
 NO 1



15th STREET & MARTIN LUTHER KING JR BLVD
 PROPOSED TYPICAL SECTION
 NO 2

LEGEND

-  PROPOSED R/W & ADD'L PROPOSED R/W
-  PROPOSED GDOT EASEMENT
-  EXISTING JOSEY HIGH SCHOOL PARKING
-  PROPOSED GDOT McINTYRE BLVD PAVEMENT/ALIGNMENT
-  PROPOSED MODIFICATION

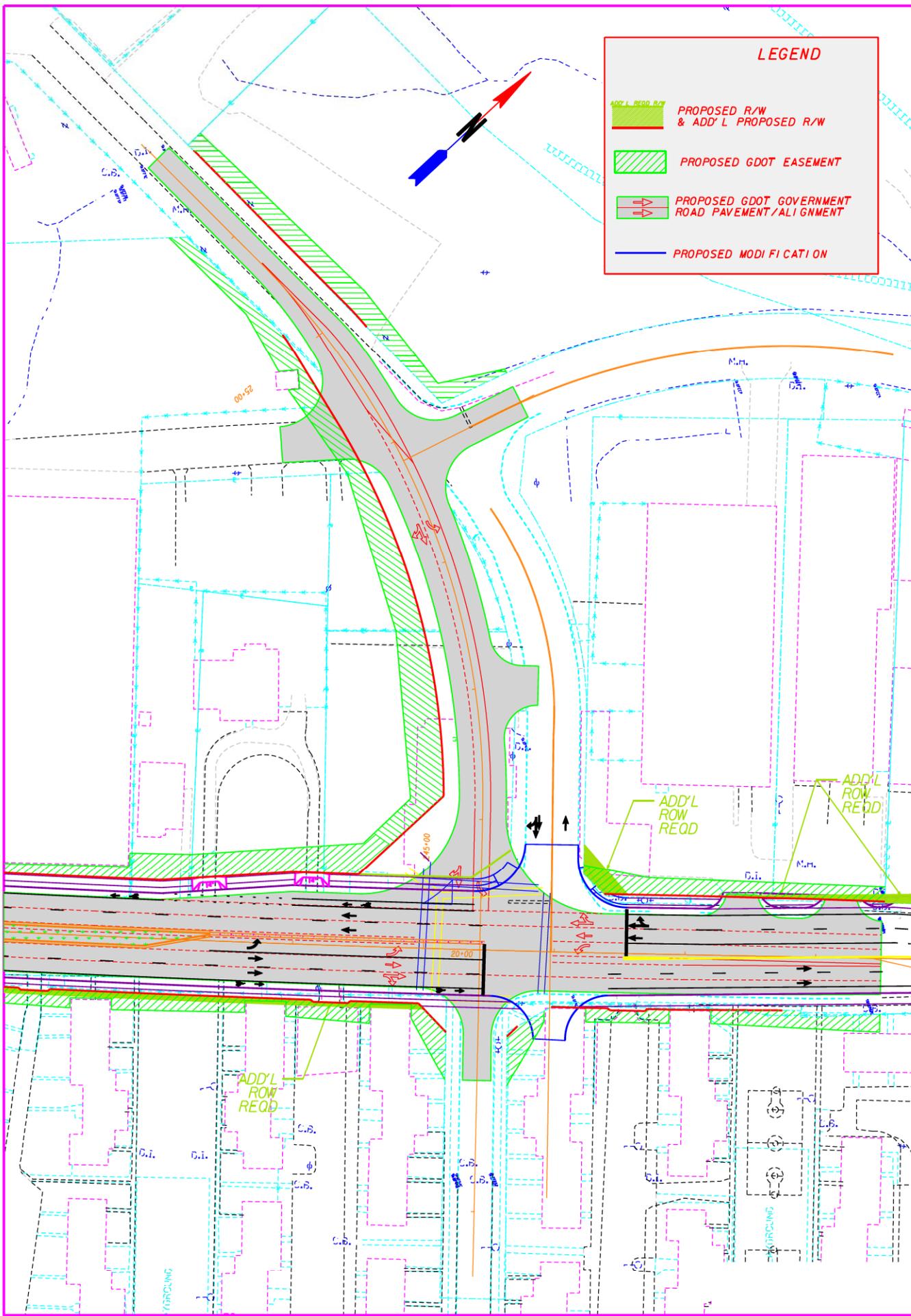
T.W. JOSEY
HIGH SCHOOL

CHURCH

RUINS



1" = 50'



LEGEND

- PROPOSED R/W & ADD'L PROPOSED R/W
- PROPOSED GDOT EASEMENT
- PROPOSED GDOT GOVERNMENT ROAD PAVEMENT/ALIGNMENT
- PROPOSED MODIFICATION

ADD'L ROW REQD

ADD'L ROW REQD

ADD'L ROW REQD

ENCLOSURE

ENCLOSURE



June 14, 2013

Paul DeCamp
Planning Director, Augusta-Richmond County Planning Commission
525 Telfair Street
Augusta, GA 30901

Dear Mr. DeCamp,

The Department has reviewed the memorandum summarizing the results of Initiative #2 of the Augusta Sustainable Development Implementation Program (ASDIP) as it relates to the S.R. 4 / 15th Street widening project (PI#220680, STP00-0043-01(057)) in Richmond County. The areas addressed by the memorandum and reviewed by GDOT are as follows:

1. Bicycle and Pedestrian Accommodations
2. Sideroad Realignments
3. Median Modifications
4. Transit Accommodations.

1. Bicycle and Pedestrian Accommodations

Regarding bicycle and pedestrian accommodations, the Department has also reviewed your recommendations to modify the typical section. The recommendations are feasible and would not cause significant delays to the project schedule or complications to the project's environmental document. The Department agrees to eliminate the multi-use path and replace it with 5-foot sidewalks and 4-foot bike lanes, based on the public involvement initiated and community input received as part of the ASDIP. The Department agrees to use header curb in lieu of 24-inch curb and gutter. A new proposed typical section that we feel best incorporates your recommendations while maintaining standards for state route geometry is attached.

2. Sideroad Realignment

The Department has reviewed your recommendations to modify the proposed alignments of Essie McIntyre Boulevard and Government Street. The Department cannot commit to revising the alignments of these roads at this time. We agree that minimizing impacts to T.W. Josey High School is important, however, relocating Essie McIntyre closer to historic resources would cause an adverse impact to these parcels. The Department must avoid adverse impacts to historic resources and their contributing features where possible. We will continue to look for ways to reduce impacts to T.W. Josey High School without creating additional adverse impacts to protected resources along the corridor.

The Department is committed to continuing to work with Augusta-Richmond County on access for Cherry Tree Crossing apartments. This access will incorporate the redevelopment plans proposed in this area. As additional access points are permitted, the Department will review the proper alignment for Government Street in cooperation with your efforts.

3. Median Modifications

The Department will continue to review the lengths of turn bays and the placement of turn lanes as traffic counts are updated through the project's life. We believe the turn lane lengths as designed are appropriate for the design traffic. Mid-block pedestrian crossings will be placed as warranted by the ongoing pedestrian study.

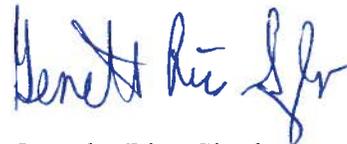
4. Transit

The Department will include accommodations for additional bus shelters as they are permitted within the project limits.

The Department is committed to working with Augusta-Richmond County as we address the transportation needs of the traveling public throughout the State of Georgia. Please forward the Department all documentation related to the extensive public involvement you have undertaken with the surrounding community.

Thank you for your continued interest in the project and for your efforts to coordinate our efforts so that we program, design, and deliver a high-quality project for the community. If you have any questions, please feel free to contact the Project Manager, Jeremy Busby, at 404-631-1154.

Sincerely,



Genetha Rice-Singleton
State Program Delivery Engineer

Cc:

Russell McMurry
Andy Casey
Glenn Bowman
Jimmy Smith
Mike Dover
Andrew Heath
Aries Little
Jeremy Busby

RECEIVED
JAN 24 2011
ROADWAY DESIGN

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF DESIGN POLICY & SUPPORT

McMurry _____
Casey _____
Hasty _____
McCook _____
Richardson _____
Other _____
File _____

LETTER OF TRANSMITTAL

TO: Russell McMurry, P.E.
GDOT State Roadway Design Engineer

DATE: January 24, 2011
PROJECT: STP00-0043-01(057)
P.I. No. 220680
COUNTY: Richmond

ATTN: Russell McMurry

PROJECT: SR 4/15th St. / Augusta from Milledgeville Rd. to Government St. – Request for Design Exception

We are sending you the following items:

- Attached (via e-mail) Under Separate Cover
 Design Exception

<u>COPIES</u>	<u>DESCRIPTION</u>
1	Request for Design Exception

These are transmittals as checked below:

- As requested For your use For approval
 For review & comment For corrections

REMARKS:

The attached request for a design exception has been approved. If you have questions or need further assistance, please call Jim Simpson at (404) 631-1605 or Brad Ehrman at (404) 631-1669.

SIGNED: Joseph Jabaley
for STATE DESIGN POLICY ENGINEER

JHS: BRE: JGJ
Enclosures

Substandard Horizontal Curve length

In Chapter 3, Page 229 of the 2004 AASHTO Green Book states that a minimum horizontal curve length shall not be less than the following formula: $L=15(V)^2$, where L is the length of curve and V is the design speed. This project has a design speed of 40 mph along SR 4/Milledgeville Rd thereby requiring the minimum length of curve to be not less than 600-ft. Along SR 4/15th Street and the side streets, the design speed varies from 25 to 35mph; therefore, the minimum length of curve shall not be less than 375-ft and 525-ft respectively.

This criteria cannot be met because this project proposes five horizontal curves that are less than the minimum length in order to reduce right of way impacts to historic resources and historic districts as well as businesses. CURVEKC9 (35 mph design speed) is located from Sta. 10+63.93 to Sta. 12+55.72 along Milledgeville Rd (beginning at mile post 21.37) for a total length of 191.78-ft and deflection angle of 43° 57' 13.9". This curve is proposed to minimize the impact to Short Stop Gas Station and Chapparell Package Store.

CURVEKC2 (40 mph design speed) is located from Sta. 109+54.78 to Sta. 112+46.61 along SR4/Milledgeville Rd (beginning at mile post 21.33) for a total length of 291.82-ft and a deflection angle of 25° 43' 24.2" which will minimize the right of way impacts to Short Stop Gas Station and Child's Dream Day Care.

CURVEKC13 (25 mph design speed) is located from Sta. 81+41.36 to Sta. 82+62.27 along Essie McIntyre Blvd (beginning at mile post 00.24) for a total length of 120.91-ft and a deflection angle of 12° 42' 43" which will reduce the right of way impacts to the historic properties of Thomasina Walker and Thomas Williams, and lessen the impact to T.W. Josey High School.

CURVEKC14 (25 mph design speed) is located from 84+78.26 to Sta. 87+23.76 along Essie McIntyre Blvd (beginning at mile post 00.32) for a total length of 245.5-ft and a deflection angle of 28° 42' 42.2" which will minimize the right of way impacts to the historic property of Jessie Walker as well as provide continuity for the intersection of Essie McIntyre Blvd and 15th Street.

CURVEKC18 (30 mph design speed) is located from 50+26.95 to Sta. 51+00.43 along Emory Street (beginning at mile post 00.01) for a total length of 73.49-ft and a deflection angle of 26° 18' 54.6" which will reduce impacts to the residence of Emily G. Johnson as well as Word Alive Outreach Ministries.

These horizontal curve lengths were designed to mimic the pre-existing alignment of the roadway. Although the curves do not meet standard lengths, the crash data does not indicate an excessive number of incidences such as being forced off the road or side swipes that normally are associated with tight curvature (see Attachment 2).

It is recommended that a design exception for substandard horizontal curve lengths be approved.

Recommended: Jamie B. Bush
Director of Engineering

1/8/2011
Date

Approved: [Signature]
Chief Engineer

1/10/11
Date

Substandard Radius of Curvature

A Design Exception is requested to retain the existing radii of 2 curves within the project limits.

CURVEKC9 has a radius of 250 feet with a deflection angle of 43° 57' 13.9" and is located between stations 10+63.93 and 12+55.72 on Milledgeville Road, which has a 35mph design speed. In Chapter 3, page 147 of the 2004 AASHTO Green Book states the minimum radius is 371 feet for the given design speed. The substandard curve is proposed to retain the current alignment as well as reduce impact to the Short Stop Gas Station and Chapparell Package Store.

CURVEKC18 has a radius of 160 feet with a deflection angle of 26° 18' 54.6" and is located between stations 50+26.95 and 51+00.43 on Emory Street, which has a 30mph design speed. In Chapter 3, page 147 of the AASHTO Green Book states the minimum radius is 250 feet for the given design speed. The substandard curve is proposed to retain the current alignment as well as reduce impact to the residence of Emily G. Johnson and Word Alive Outreach Ministries.

The horizontal curves were designed to mimic the pre-existing alignment of the roadway. Although the curves do not meet standard radii, the crash data does not indicate an excessive number of incidences such as being forced off the road or side swipes that normally are associated with tight curvature (see Attachment 2).

It is recommended that a design exception for substandard radius of curvature be approved.

Recommended: James B. Bush
Director of Engineering

1/6/2011
Date

Approved: Quilley M. R.
Chief Engineer

1/14/11
Date

Substandard Angle of Intersection/Skew Angle

In Chapter 5, Page 400 of the 2004 AASHTO Green Book states that the alignment design should be adjusted to avoid an angle of intersection of less than 60 degrees.

This criteria cannot be met because the proposed design will maintain the SR 4/M.L. King Blvd. and 15th Street skew angle of intersection of approximately 37°37'43.6" with a design speed of 40 mph on SR 4/15th Street. In order to meet 2004 AASHTO requirements, the entire 15th Street corridor would have to be re-aligned from the existing footprint adding right of way impacts to numerous historic resources along the corridor as well as commercial properties and residences. The proposed design will also avoid the reconstruction of a four-barrel, 10 feet x 5 feet bridge culvert at the intersection.

Several alternatives were considered to improve the angle at the intersection. One design alternative consisted of changing the intersection to a curved intersection and re-aligning Wooten Rd with M.L. King Blvd creating a substandard skew angle for M.L. King Blvd. In order to accommodate a curve at the intersection, the culvert would have to be extended at an estimated construction material cost of \$45,822.82 in addition to impacting historic resources along SR 4/15th Street. Another alternative consisted of a curved intersection and re-aligning Wooten Rd with 15th Avenue and a cul-de-sac of M.L. King Blvd. Traffic conditions as well as a survey of opinion taken at a Citizens' Advisory Team meeting both favor the current proposed design.

As a means of mitigation, the incorporation of a cul-de-sac at Wooten Rd is proposed in the current design, removing its traffic from the intersection. This will improve operation of the intersection by reducing traffic and the number of decision points for drivers to consider.

It is recommended that a design exception for substandard angle of intersection be approved.

Recommended: 
Director of Engineering

1/6/2011
Date

Approved: 
Chief Engineer

1/10/11
Date

RRM: MDR
Attachments

Attachment 1

Crashes/ Crash Rates for the SR4 / Milledgeville Road
From: Milledgeville Road to Wooten Road

	<u>2007</u>		<u>2008</u>		<u>2009</u>	
	SR 4/ Milledgeville Rd.	State	SR 4/ Milledgeville Rd.	State	SR 4/ Milledgeville Rd.	State
Crashes	76		74		65	
Crash Rate	820	637	798	727	723	787
Injuries	25		27		33	
Injury Rate	270	159	291	179	367	189
Fatalities	0		0		0	
Fatality Rate	0	1.26	0	1.73	0	1.87

Crashes/ Crash Rates for the SR4 / 15th Street
From: Milledgeville Road to Government Street

	<u>2007</u>		<u>2008</u>		<u>2009</u>	
	SR 4/ 15 th St	State	SR 4/ 15 th St	State	SR 4/ 15 th St	State
Crashes	65		74		40	
Crash Rate	420	637	1152	727	195	787
Injuries	27		32		21	
Injury Rate	420	159	498	179	102	189
Fatalities	0		0		0	
Fatality Rate	0	1.26	0	1.73	0	1.87

Attachment 2

**Crash Type for the SR4 / Milledgeville Road
From: Milledgeville Road to Wooten Road**

Type of Crash	2007	2008	2009	Total	Percent
Angle	25	23	29	77	36%
Head On	5	3	2	10	1%
Rear End	30	35	20	85	40%
Side Swipe	9	7	11	27	10%
Not a Collision w/a Vehicle	7	6	3	16	13%
Sub-Total	76	74	65	215	100%

**Crash Type for the SR4 / 15th Street
From: Milledgeville Road to Government Street**

Type of Crash	2007	2008	2009	Total	Percent
Angle	21	15	11	47	26%
Head On	1	1	0	2	1%
Rear End	34	38	23	95	53%
Side Swipe	4	10	4	18	10%
Not a Collision w/a Vehicle	5	10	2	17	10%
Sub-Total	65	74	40	179	100%

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP00-0043-01(057), Richmond County OFFICE Roadway Design
SR4/15th St. / Augusta from Milledgeville Rd. to
Government St.
P. I. No. 220680 DATE November 8, 2010

FROM MR Maurico Ricks, Roadway Design Engineer II

TO Russell R. McMurry, P.E., State Roadway Design Engineer RM

SUBJECT **Request Design Variance**

A design variance is requested for the above noted project.

Project STP00-0043-01(057) is a proposal to improve SR 4 from Milledgeville Road to Government Road with reconstruction and widening. First, the project proposes to reconstruct the section of SR 4 between Milledgeville Road and 15th Street from a five-lane section to a four lane section (2 lanes in each direction) separated by a variable width raised median with provision for left turn lanes at median openings. In addition, the travel lane widths are proposed to be reduced slightly from 12-foot wide to 11-foot wide, thereby allowing the proposed pavement width to remain within the same footprint as the existing pavement. Second, the project proposes to widen SR 4/15th Street from the intersection of MLK, Jr. Boulevard at 15th Street to Government Road from two lanes to four 11-foot wide lanes (2 lanes in each direction) separated by a variable width raised median with provision for left turn lanes at median openings.

There is also 5-foot wide sidewalk proposed to be constructed on both sides of the roadway (with the existing sidewalk maintained wherever possible) from Milledgeville Road to Olive Road, and an 8-foot wide shared use path from Olive Road to Government Road on the north side of the roadway and a 5-foot wide sidewalk on the south side of the roadway. The project length is approximately 1.59 miles.

The project also proposes to cul-de-sac the south end of Wooten Road (to eliminate its intersection with SR 4/15th Street). All except one of the existing signalized intersections with SR 4 will remain signalized. The signal at the former Castleberry plant is proposed to be removed. The intersections that will remain signalized include Milledgeville Road/Deans Bridge Road, Tubman Home Road, Olive Road, MLK Jr. Boulevard, Essie McIntyre Boulevard, and Government Road. Pedestrian crosswalks would be installed at each of these intersections. A revised Concept Report was approved on June 23, 2008.

The following design variance is being requested:

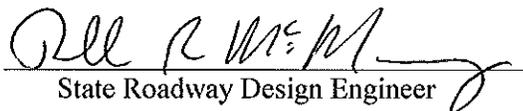
- Median Width

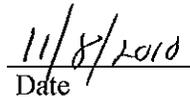
Median Width

The current GDOT Design Policy Manual revised June 2010 recommends in section 6.12 that a 20-foot wide raised median or preferably a 24-foot wide raised median depending on the impacts to all urban arterials with a base year traffic volume $\geq 18,000$ ADT and design year volumes $\geq 24,000$ ADT and a design speed of ≤ 45 mph. For this project, traffic volumes are 36,575 A.D.T. for the year 2017 and 49,675 A.D.T. for the year 2037 with design speeds of 40 mph and 35 mph.

This project proposes to construct the medians with widths of 18-feet along SR4/Milledgeville Road and 16 feet along SR4/15th Street. The 18 foot wide median along Milledgeville Road is proposed to minimize impacts to the House of Cheung restaurant, G&O automotive, and the historic residence of Benjamin J. Tompkins. The median along 15th street was designed with a width of 16 feet to reduce the impacts to numerous historic resources and historic districts along the corridor including the Williams Memorial C.M.E. church. The proposed median widths were implemented upon consideration of the Value Engineering study performed on June 8, 2007. The median widths are designed to allow storage space for turning vehicles at openings and separate opposing traffic flows along the mainline. The design reduces opportunities for angle, head on, and side swipe crashes which cumulatively account for 86% of crashes along Milledgeville Rd. and 90% of crashes along 15th Street.

It is recommended that a design variance for median width be approved.

Approved: 
State Roadway Design Engineer


Date

MDR: MDR
Attachments

Attachment 1

Crashes/ Crash Rates for the SR4 / Milledgeville Road
From: Milledgeville Road to Wooten Road

	<u>2007</u>		<u>2008</u>		<u>2009</u>	
	SR 4/ Milledgeville Rd.	State	SR 4/ Milledgeville Rd.	State	SR 4/ Milledgeville Rd.	State
Crashes	76		74		65	
Crash Rate	820	637	798	727	723	787
Injuries	25		27		33	
Injury Rate	270	159	291	179	367	189
Fatalities	0		0		0	
Fatality Rate	0	1.26	0	1.73	0	1.87

Crashes/ Crash Rates for the SR4 / 15th Street
From: Milledgeville Road to Government Street

	<u>2007</u>		<u>2008</u>		<u>2009</u>	
	SR 4/ 15 th St	State	SR 4/ 15 th St	State	SR 4/ 15 th St	State
Crashes	65		74		40	
Crash Rate	420	637	1152	727	195	787
Injuries	27		32		21	
Injury Rate	420	159	498	179	102	189
Fatalities	0		0		0	
Fatality Rate	0	1.26	0	1.73	0	1.87

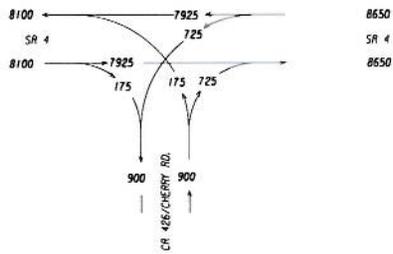
Attachment 2

Crash Type for the SR4 / Milledgeville Road From: Milledgeville Road to Wooten Road

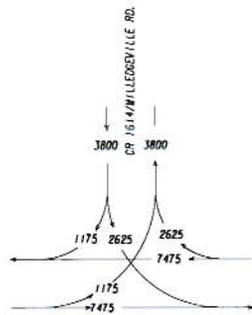
Type of Crash	2007	2008	2009	Total	Percent
Angle	25	23	29	77	36%
Head On	5	3	2	10	1%
Rear End	30	35	20	85	40%
Side Swipe	9	7	11	27	10%
Not a Collision w/a Vehicle	7	6	3	16	13%
Sub-Total	76	74	65	215	100%

Crash Type for the SR4 / 15th Street From: Milledgeville Road to Government Street

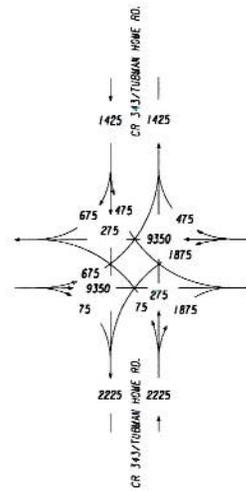
Type of Crash	2007	2008	2009	Total	Percent
Angle	21	15	11	47	26%
Head On	1	1	0	2	1%
Rear End	34	38	23	95	53%
Side Swipe	4	10	4	18	10%
Not a Collision w/a Vehicle	5	10	2	17	10%
Sub-Total	65	74	40	179	100%



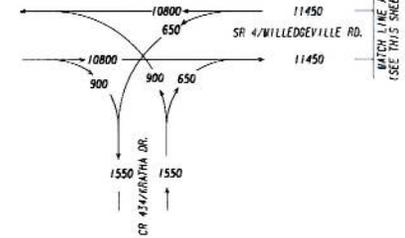
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SR 4
8650



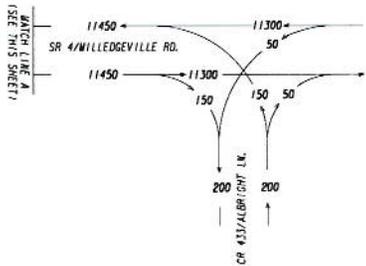
10100
SR 4/WILLEDGEVILLE RD.
10100



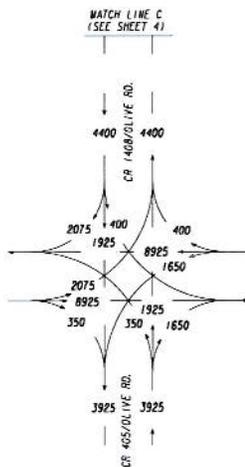
11700
SR 4/WILLEDGEVILLE RD.
11700



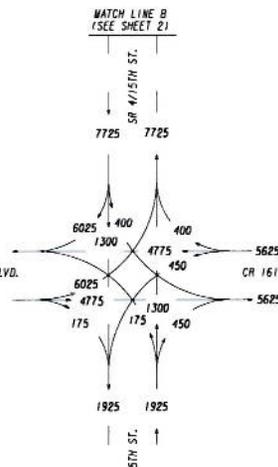
MATCH LINE A
(SEE THIS SHEET)



11350
SR 4/WILLEDGEVILLE RD.
11350



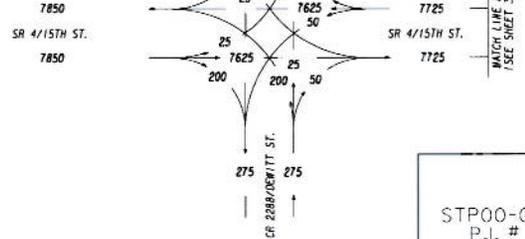
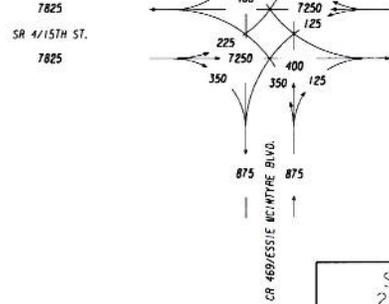
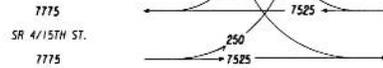
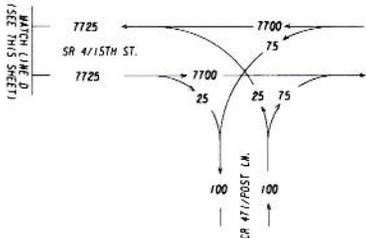
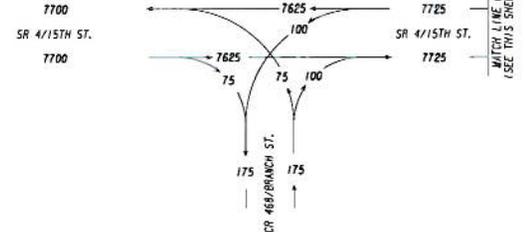
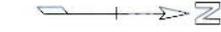
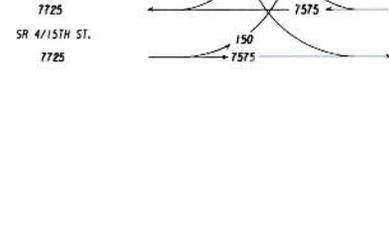
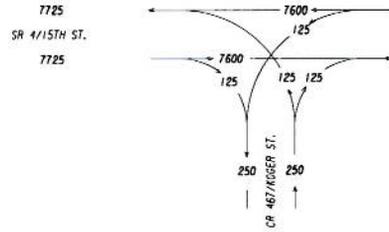
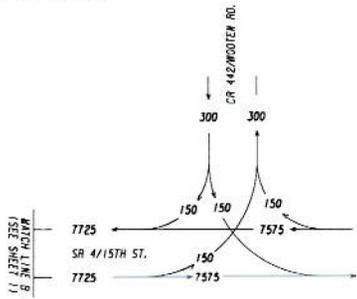
10975
SR 4/MARTIN LUTHER KING JR. BLVD.
10975



SR 4/WILLEDGEVILLE RD.
24 HR T = 11%
S.U. = 6%
COMB. = 5%

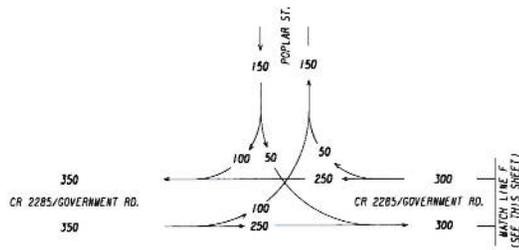
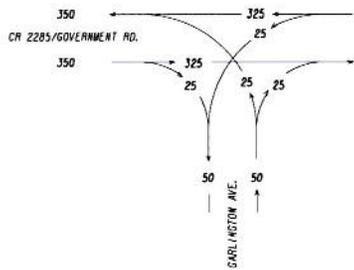
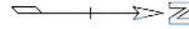
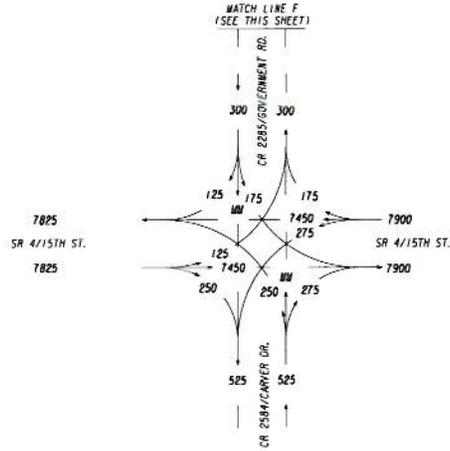
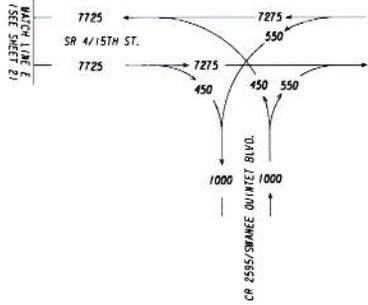
STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY

SR 4
2013 AADT



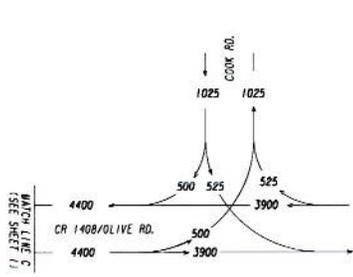
SR 4/15TH ST.
24 HR T = 11.5%
S.U. = 8%
COMB. = 3.5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
2013 AADT

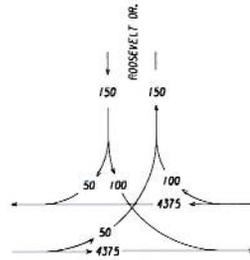


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24 HR T = 11.5%
S.U. = 8%
COMB. = 3.5%

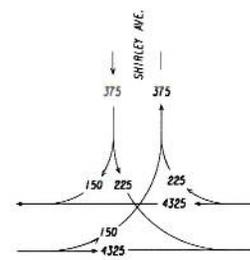
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P.L. # 220680
RICHMOND COUNTY
SR 4
2013 AADT
FH
7/13



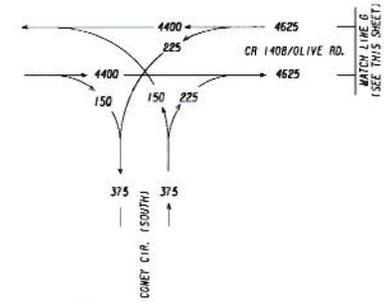
4425
CR 1408/OLIVE RD.
4425



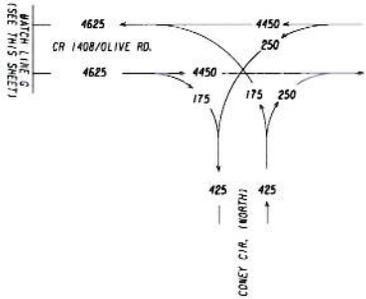
4475
CR 1408/OLIVE RD.
4475



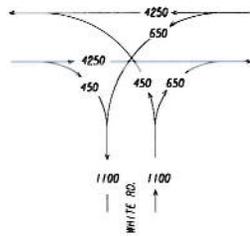
4550
CR 1408/OLIVE RD.
4550



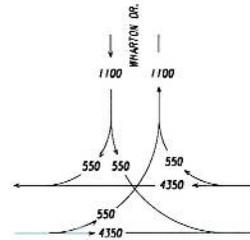
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(SEE THIS SHEET)



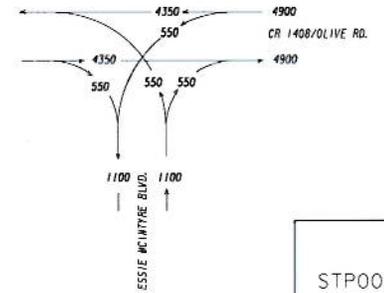
4700
CR 1408/OLIVE RD.
4700



4900
CR 1408/OLIVE RD.
4900

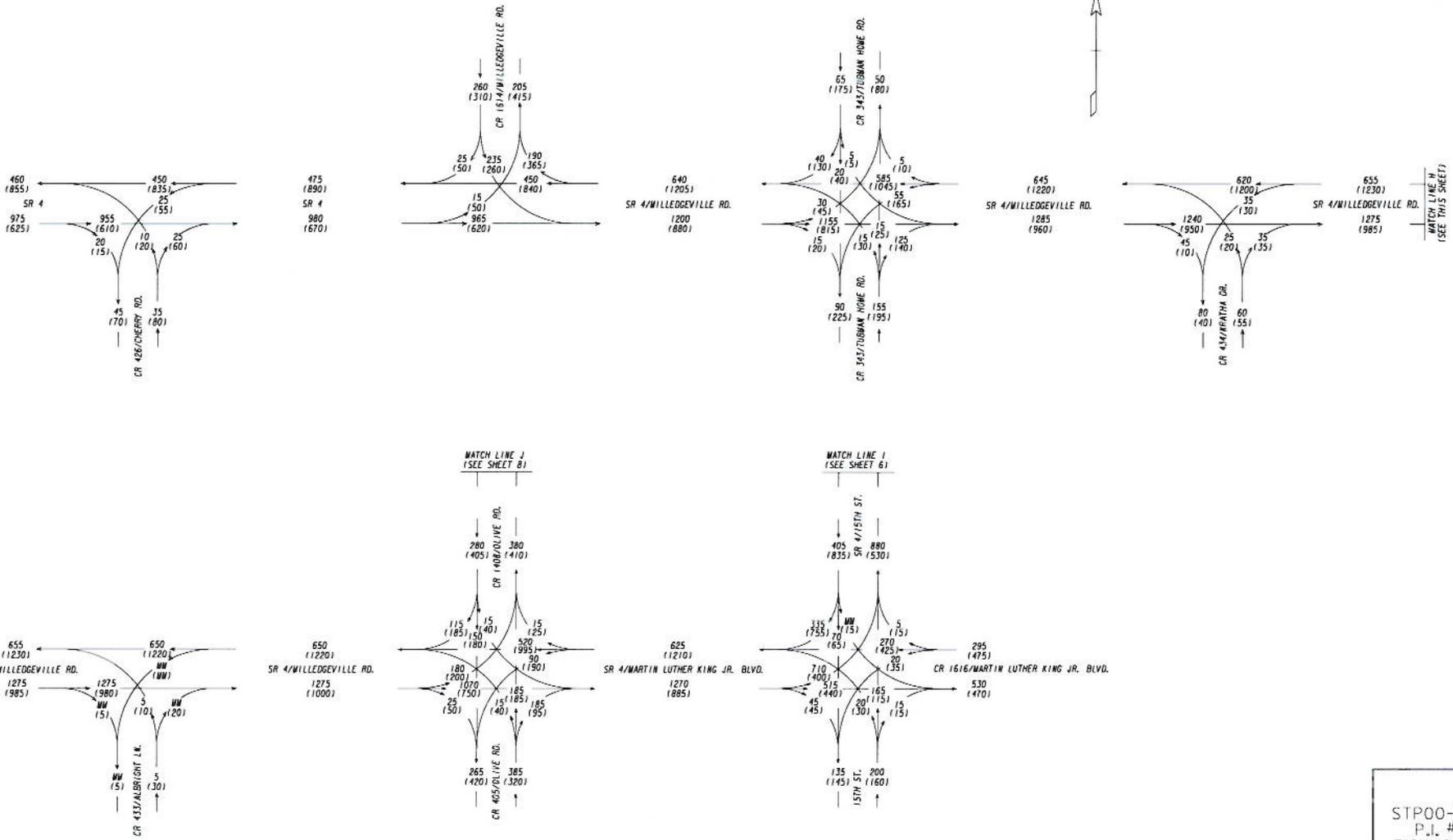


4900
CR 1408/OLIVE RD.
4900



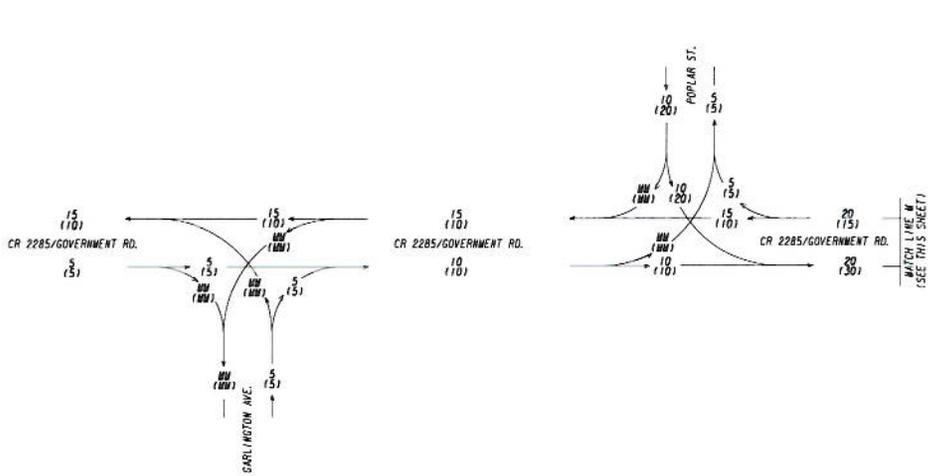
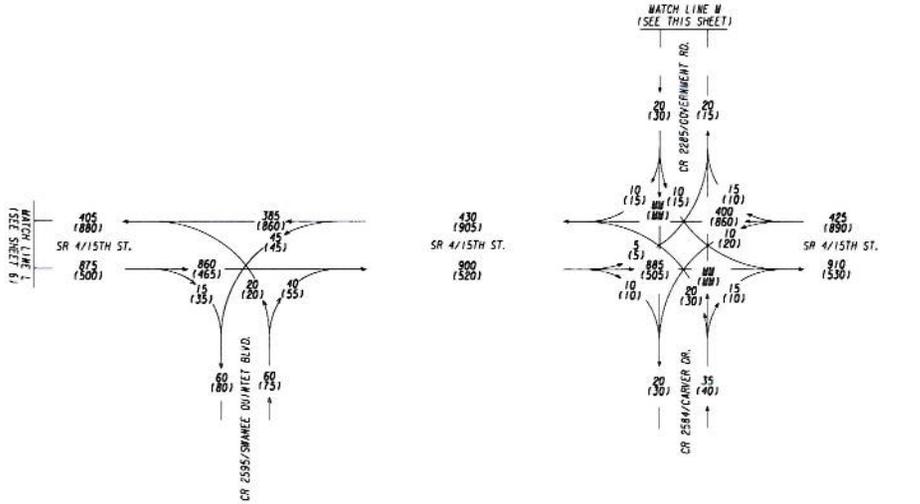
OLIVE RD.
24 HR T = 5.5%
S.U. = 4%
COMB. = 1.5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
2013 AADT



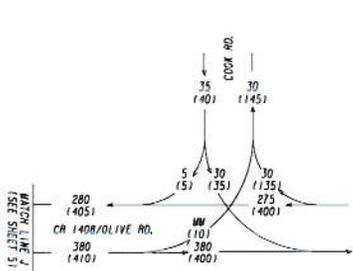
SR 4/MILLEDGEVILLE RD.
T = 12%
S.U. = 8.5%
COMB. = 3.5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
2013 AM DHV = 000
2013 PM DHV = (000)

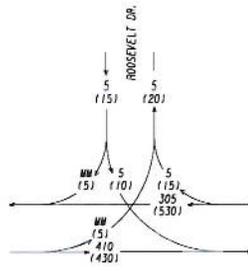


SR 4/15TH ST.
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S.U. = 10.5%
COMB. = 2.5%

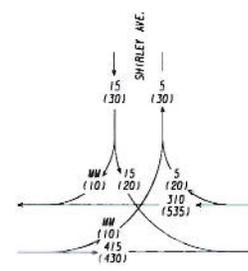
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P.I. # 220680
RICHMOND COUNTY
SR 4
2013 AM DHV = 000
2013 PM DHV = (000)



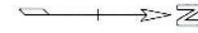
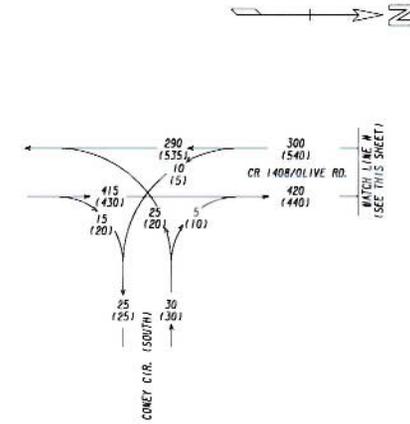
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CR 140B/OLIVE RD.
410 (435)



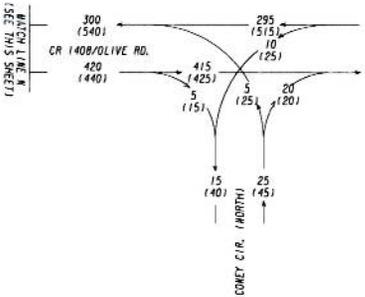
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CR 140B/OLIVE RD.
415 (440)



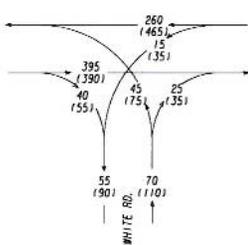
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CR 140B/OLIVE RD.
430 (450)



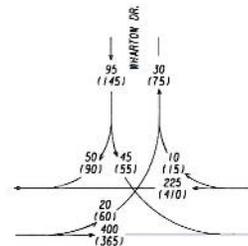
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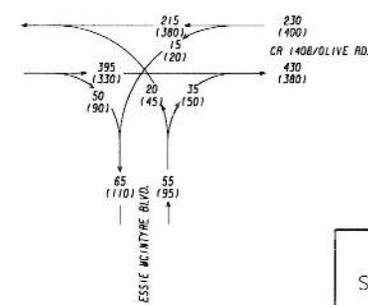
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CR 140B/OLIVE RD.
435 (445)



275 (500)
CR 140B/OLIVE RD.
420 (425)

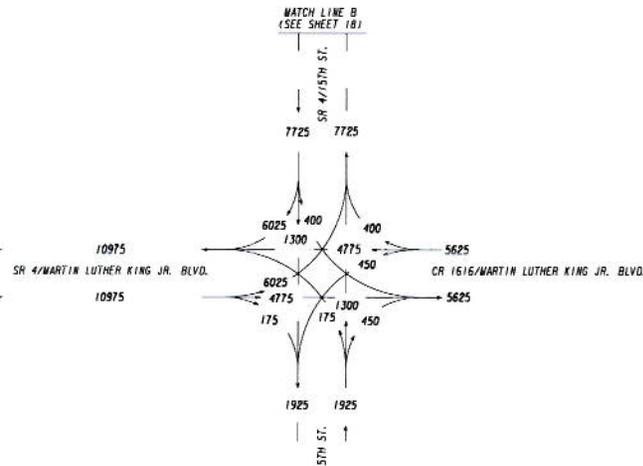
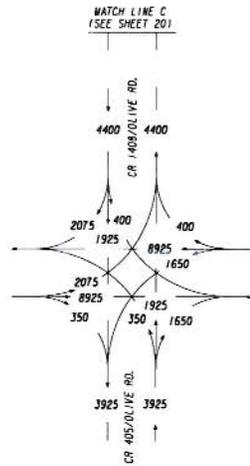
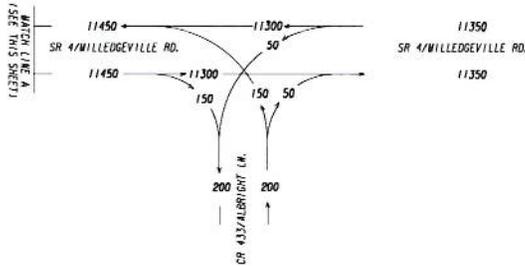
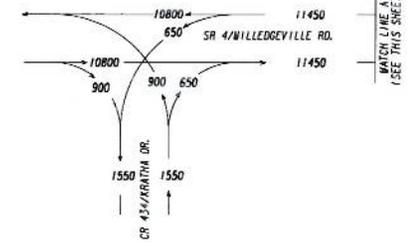
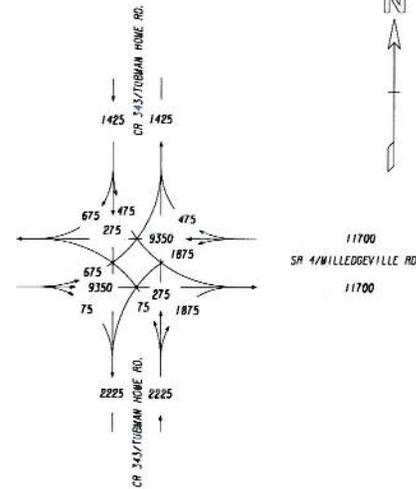
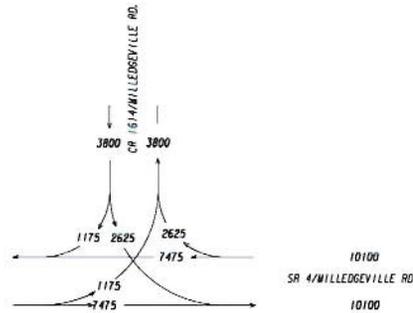
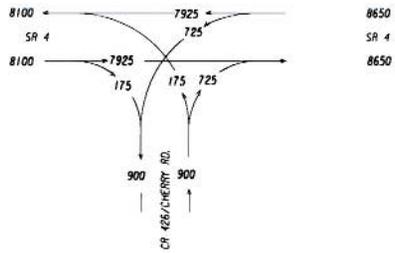


275 (425)
CR 140B/OLIVE RD.
445 (420)



OLIVE RD.
T = 5%
S.U. = 4.5%
COMB. = 0.5%

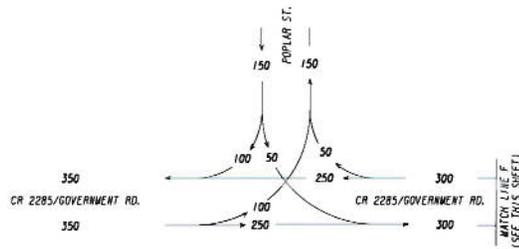
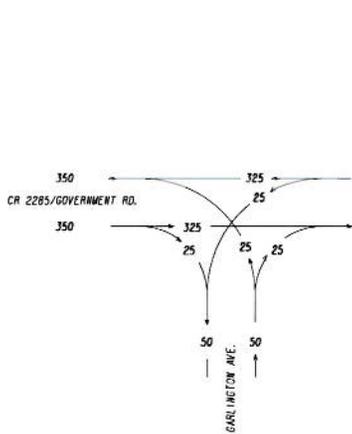
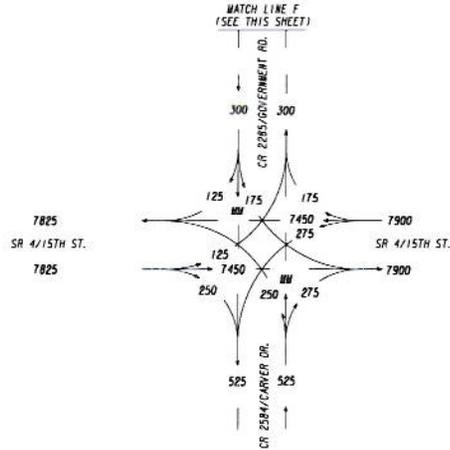
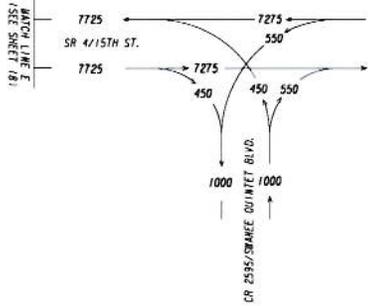
STP00-0043-0(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
2013 AM DHV = 000
2013 PM DHV = (000)
FH
7/13



SR 4/WILLEDGEVILLE RD.
24 HR T = 11%
S.U. = 6%
COMB. = 5%

STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY

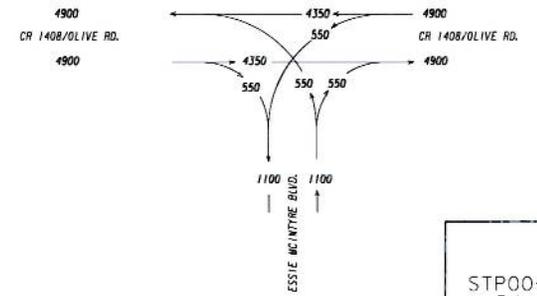
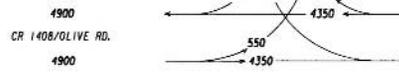
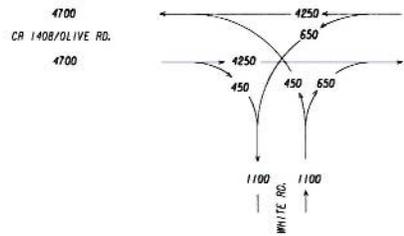
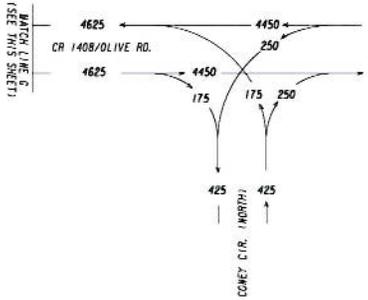
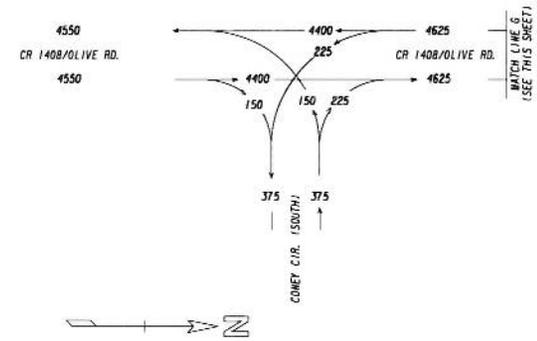
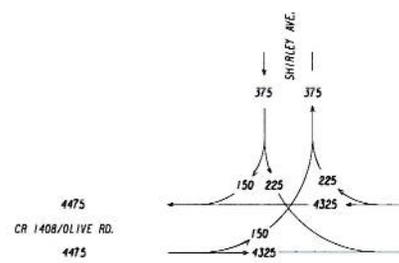
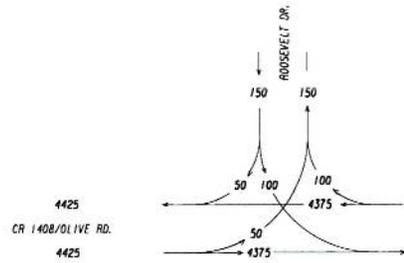
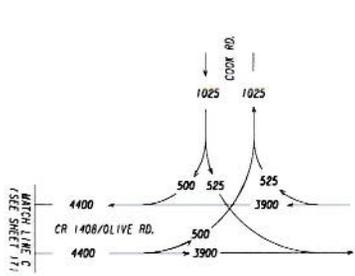
SR 4
ALT. A
2020 AADT



SR 4/15TH ST.
 24 HR T = 11.5%
 S.U. = 8%
 COMB. = 3.5%

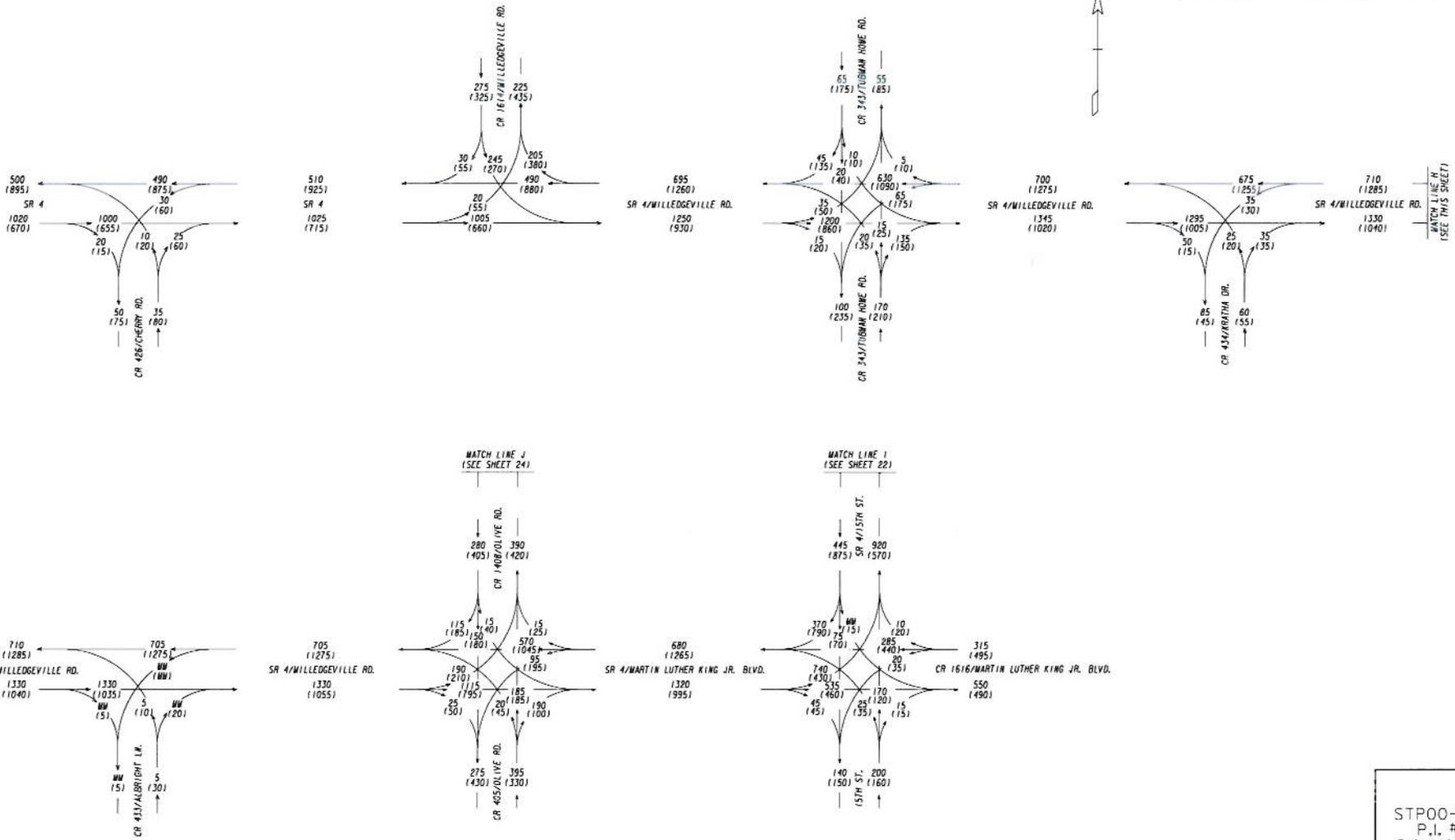
STP00-0043-01(57)
 P.L. # 220680
 RICHMOND COUNTY

SR 4
 ALT. A
 2020 AADT



OLIVE RD.
24 HR T = 5.5%
S.U. = 4%
COMB. = 1.5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2020 AADT
FH
7/13

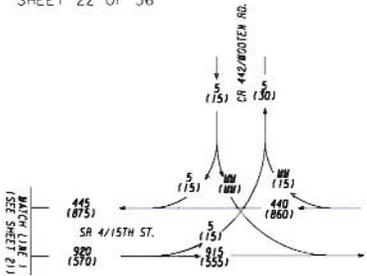


SR 4/MILLEDGEVILLE RD.
T = 12%
S.U. = 8.5%
COMB. = 3.5%

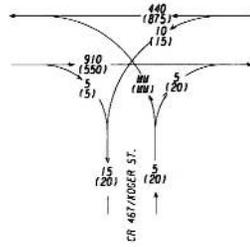
STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY

SR 4
ALT. A
2020 AM DHV = 000
2020 PM DHV = (000)

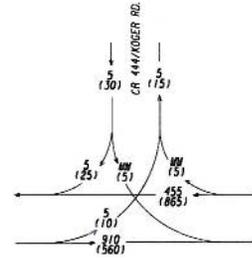
FH
7/13



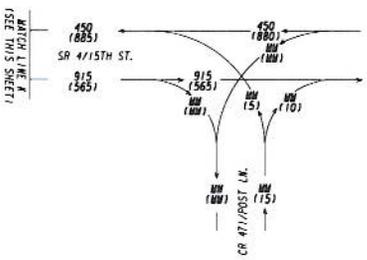
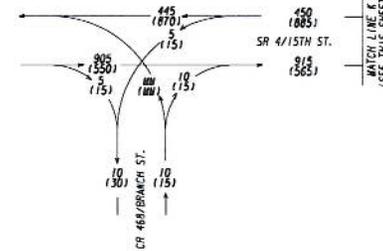
440 (875)
SR 4/15TH ST.
915 (355)



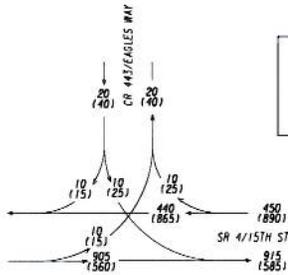
450 (890)
SR 4/15TH ST.
915 (370)



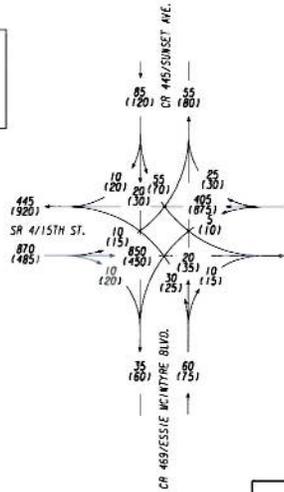
445 (870)
SR 4/15TH ST.
910 (365)



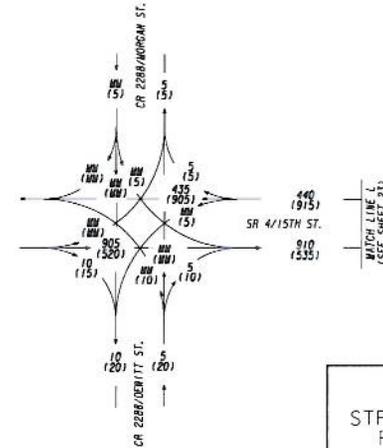
450 (880)
SR 4/15TH ST.
915 (375)



T.W. JOSEY
HIGH SCHOOL



435 (915)
SR 4/15TH ST.
915 (335)

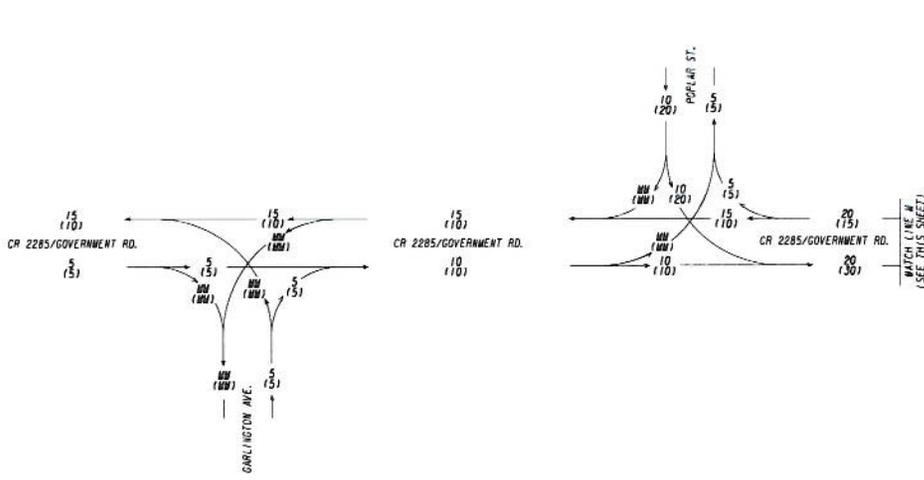
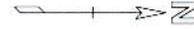
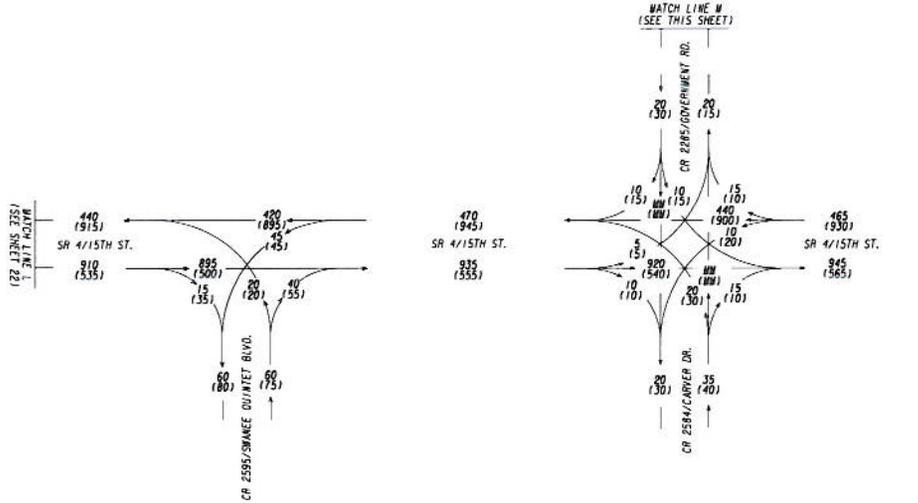


440 (915)
SR 4/15TH ST.
910 (335)

SR 4/15TH ST.
T = 13%
S.U. = 10.5%
COMB. = 2.5%

STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY

SR 4
ALT. A
2020 AM DHV = 000
2020 PM DHV = (000)

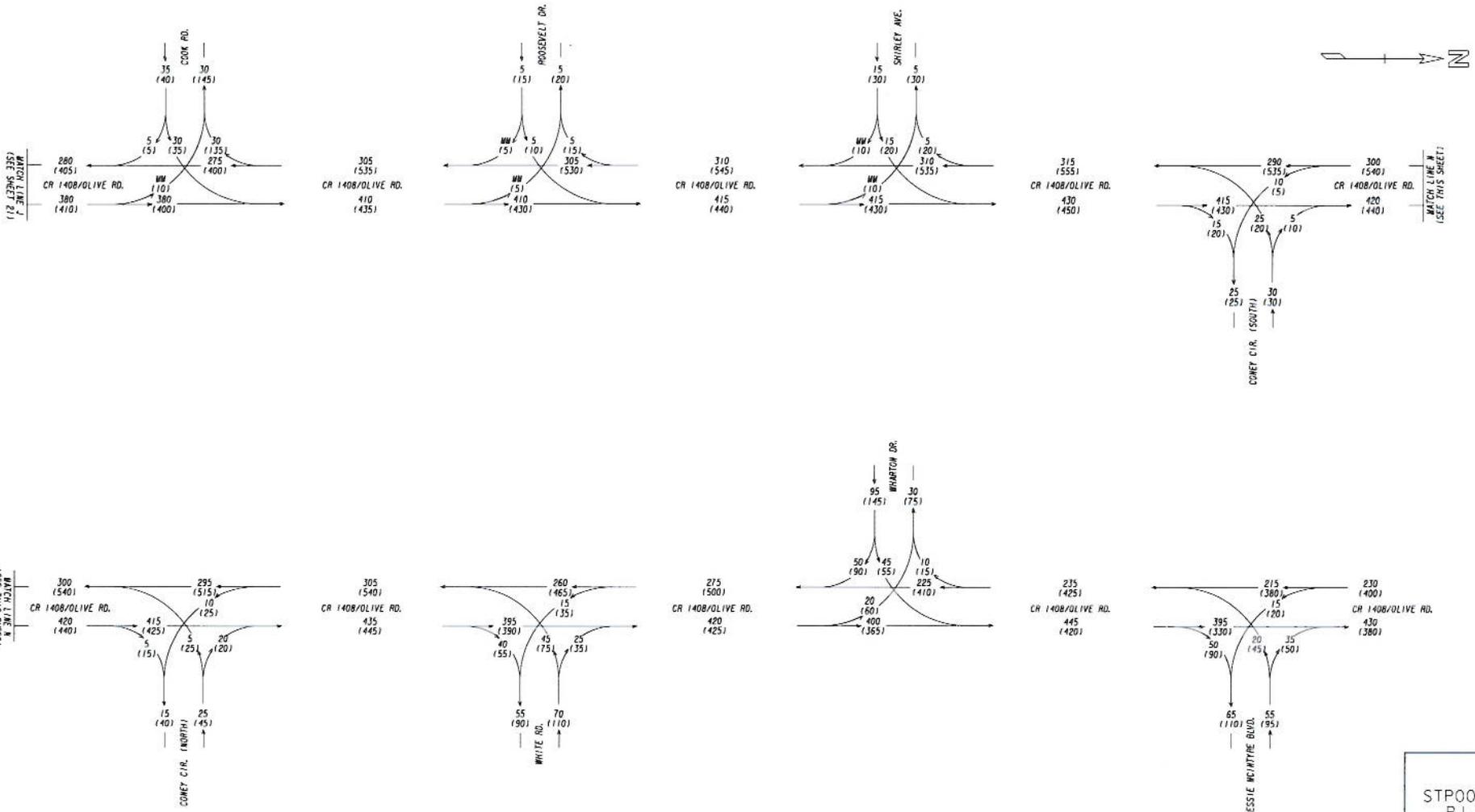


SR 4/15TH ST.
T = 13%
S.U. = 10.5%
COMB. = 2.5%

STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY

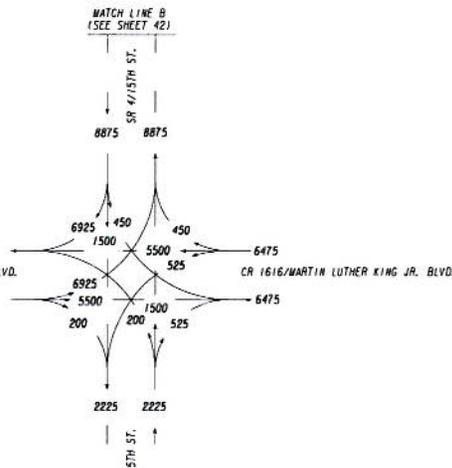
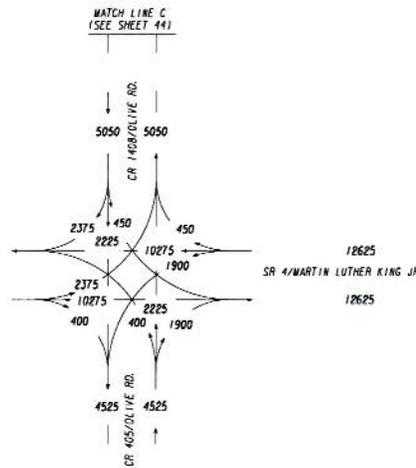
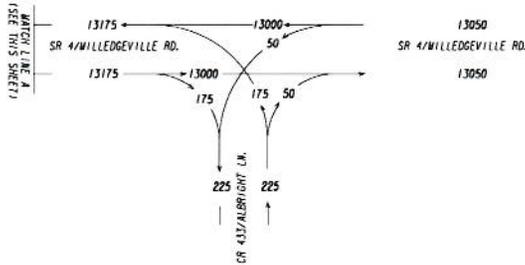
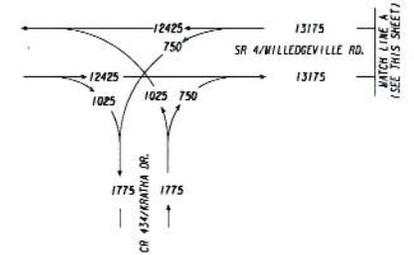
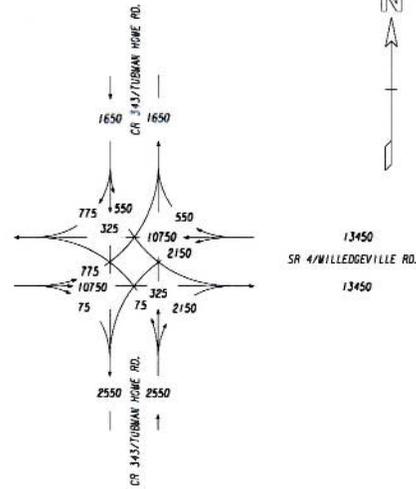
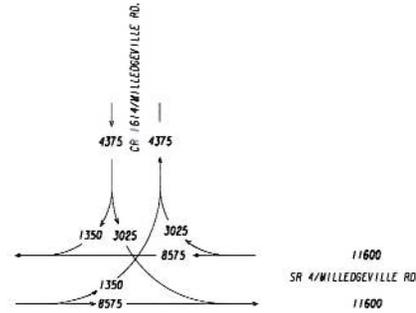
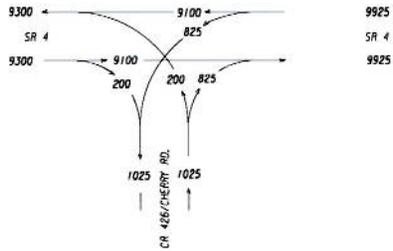
SR 4
ALT. A
2020 AM DHV = 000
2020 PM DHV = (000)

FH
7/13



OLIVE RD.
T = 5%
S.U. = 4.5%
COMB. = 0.5%

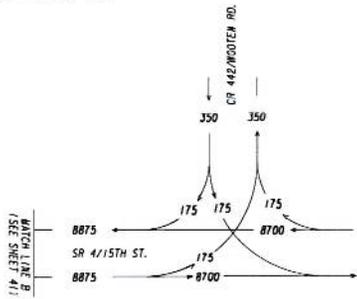
STP00-0043-0(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2020 AM DHV = 000
2020 PM DHV = (000)



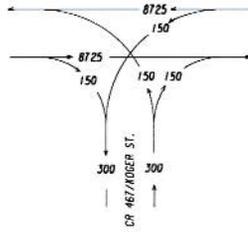
SR 4/WILLEDGEVILLE RD.
24 HR T = 11%
S.U. = 6%
COMB. = 5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY

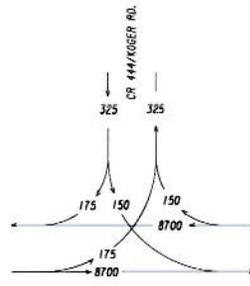
SR 4
ALT. A
2040 AADT



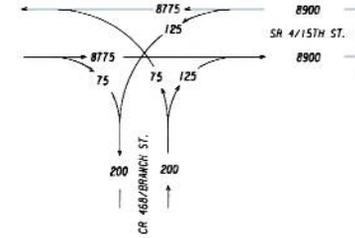
8875
SR 4/15TH ST.
8875



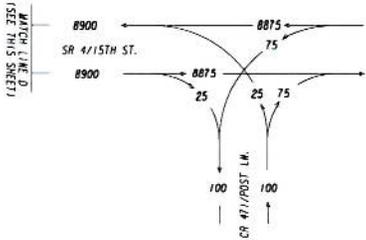
8875
SR 4/15TH ST.
8875



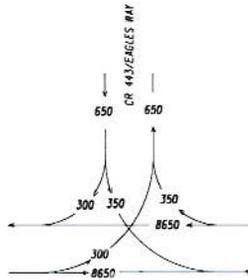
8850
SR 4/15TH ST.
8850



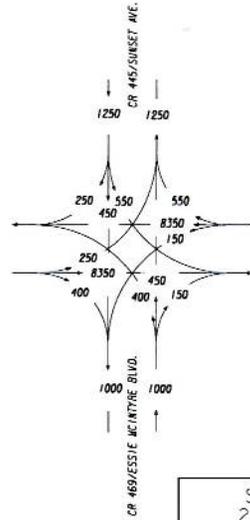
8900
SR 4/15TH ST.
8900



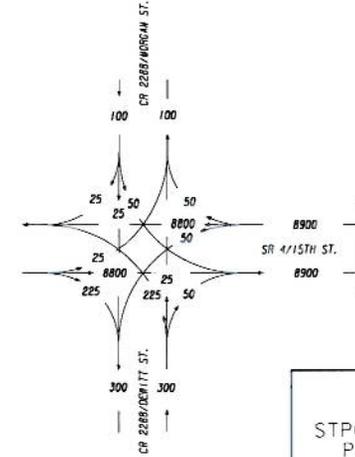
8950
SR 4/15TH ST.
8950



9000
SR 4/15TH ST.
9000



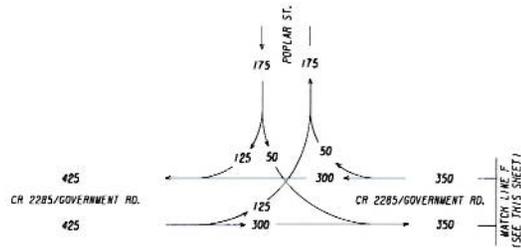
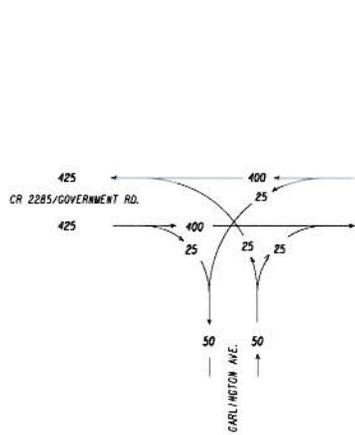
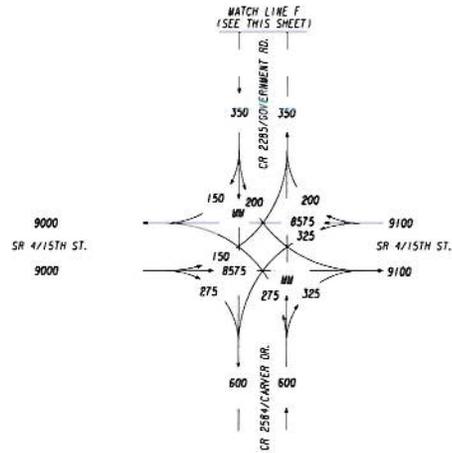
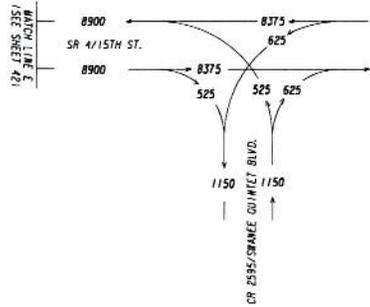
9050
SR 4/15TH ST.
9050



8900
SR 4/15TH ST.
8900

SR 4/15TH ST.
24 HR T = 11.5%
S.U. = 8%
COMB. = 3.5%

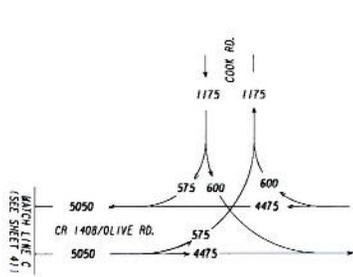
STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2040 AADT



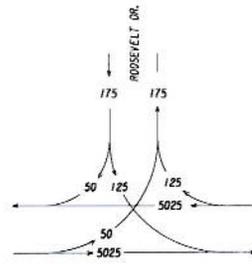
SR 4/15TH ST.
24 HR T = 11.5%
S.U. = 8%
COMB. = 3.5%

STP00-0043-01(57)
P.J. # 220680
RICHMOND COUNTY

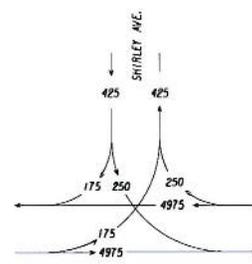
SR 4
ALT. A
2040 AADT



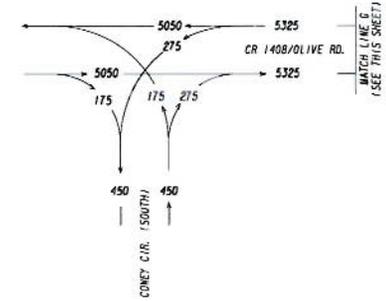
5075
CR 1408/Olive Rd.
5075



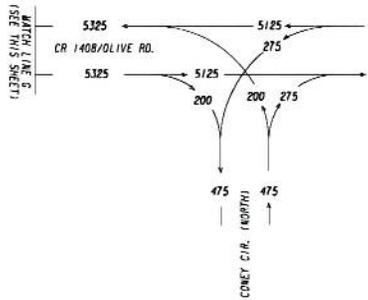
5150
CR 1408/Olive Rd.
5150



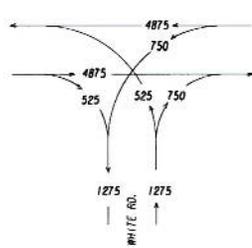
5225
CR 1408/Olive Rd.
5225



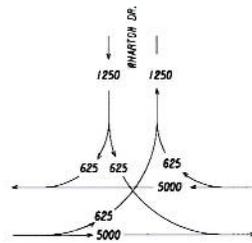
5325
CR 1408/Olive Rd.
5325



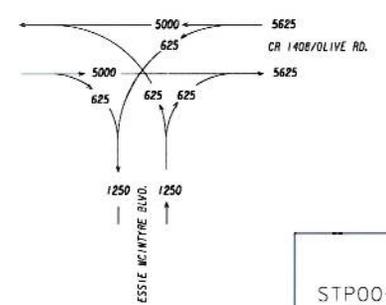
5400
CR 1408/Olive Rd.
5400



5625
CR 1408/Olive Rd.
5625



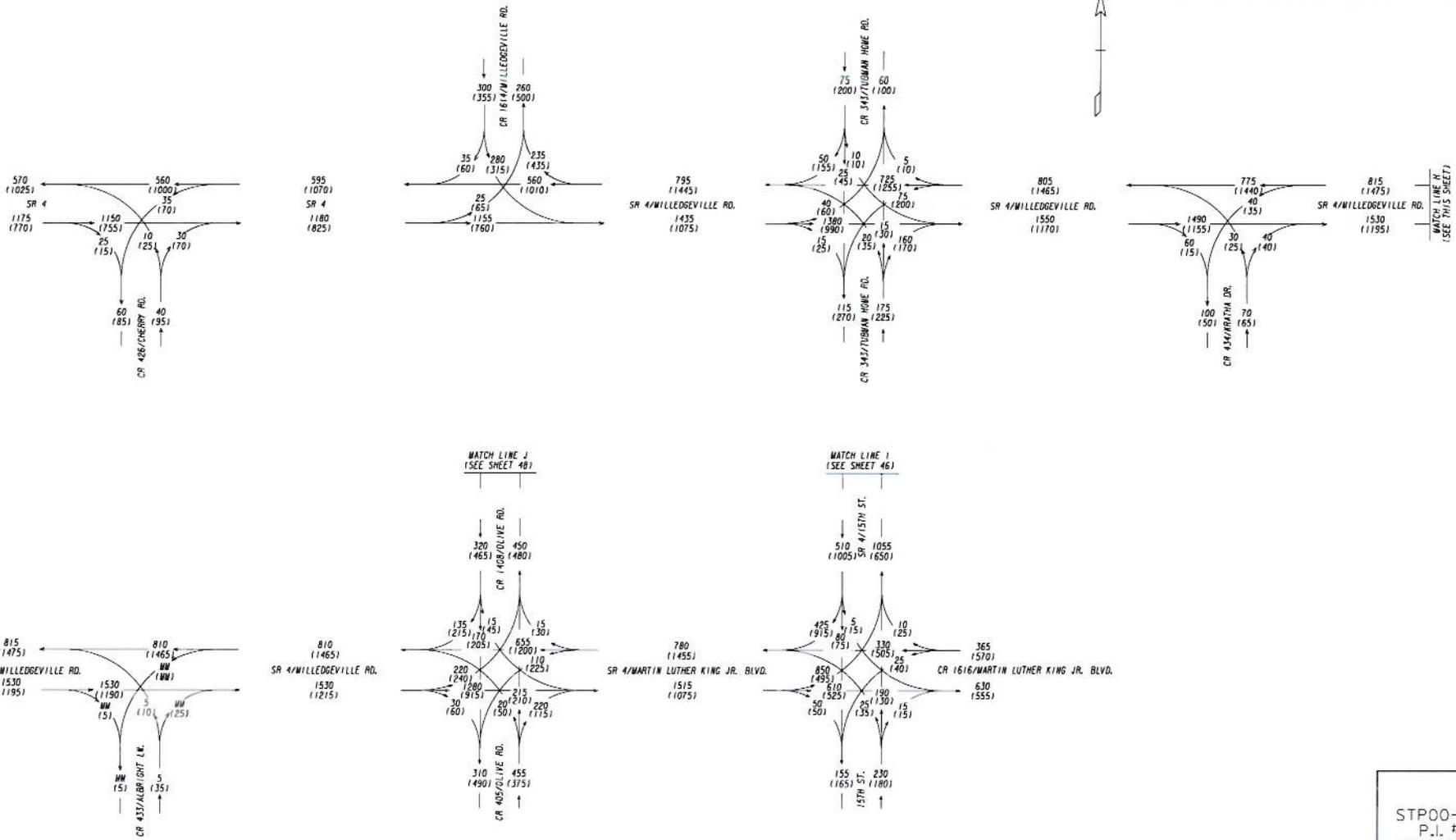
5625
CR 1408/Olive Rd.
5625



5625
CR 1408/Olive Rd.
5625

OLIVE RD,
24 HR T = 5.5%
S.U. = 4%
COMB. = 1.5%

STP00-0043-01(57)
P.I. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2040 AADT

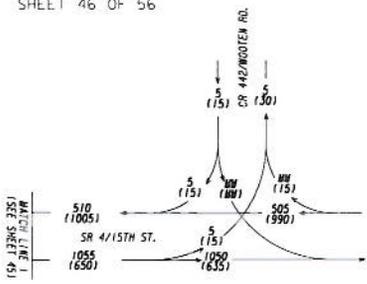


SR 4/MILLEDGEVILLE RD.
T = 12%
S.U. = 8.5%
COMB. = 3.5%

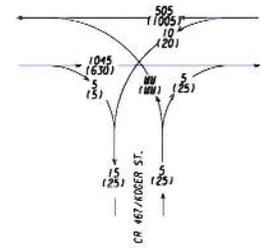
STP00-0043-0(57)
P.I. # 220680
RICHMOND COUNTY

SR 4
ALT. A
2040 AM DHV = 000
2040 PM DHV = (000)

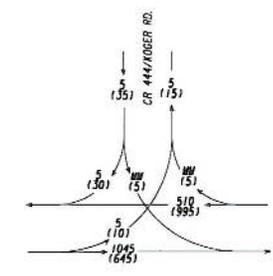
FH
7/15



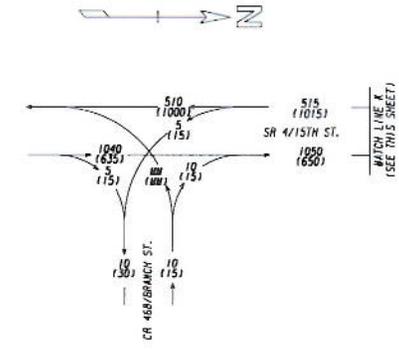
505 (1005)
SR 4/15TH ST.
1050 (655)



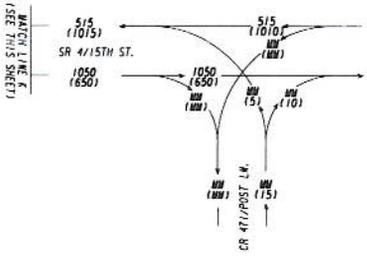
515 (1025)
SR 4/15TH ST.
1050 (655)



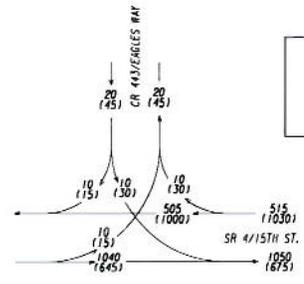
510 (1000)
SR 4/15TH ST.
1045 (650)



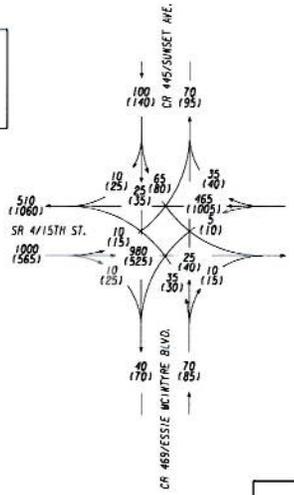
515 (1015)
SR 4/15TH ST.
1050 (650)



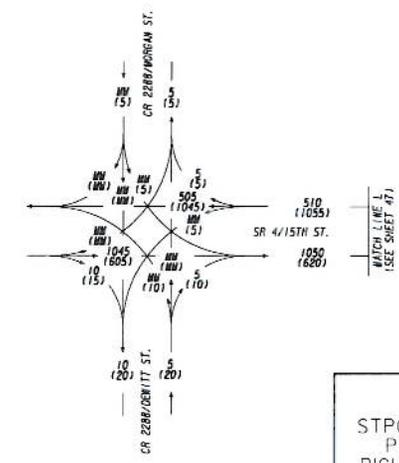
515 (1010)
SR 4/15TH ST.
1050 (660)



T.W. JOSEY
HIGH SCHOOL



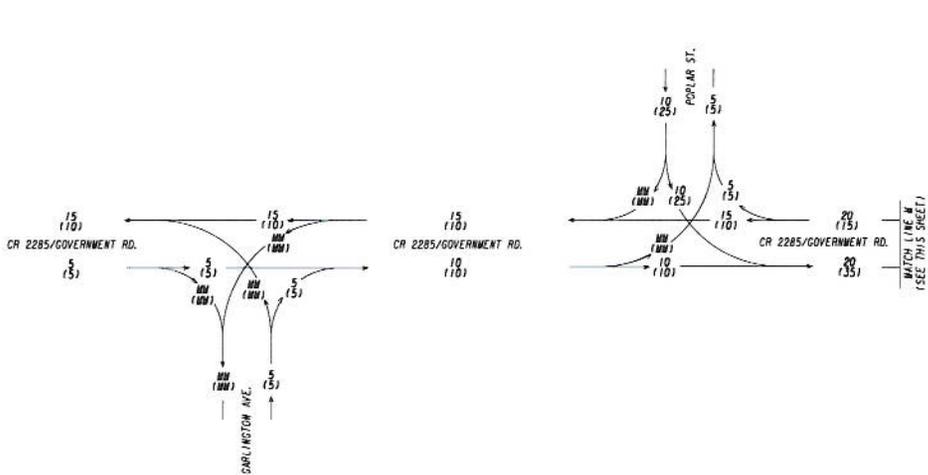
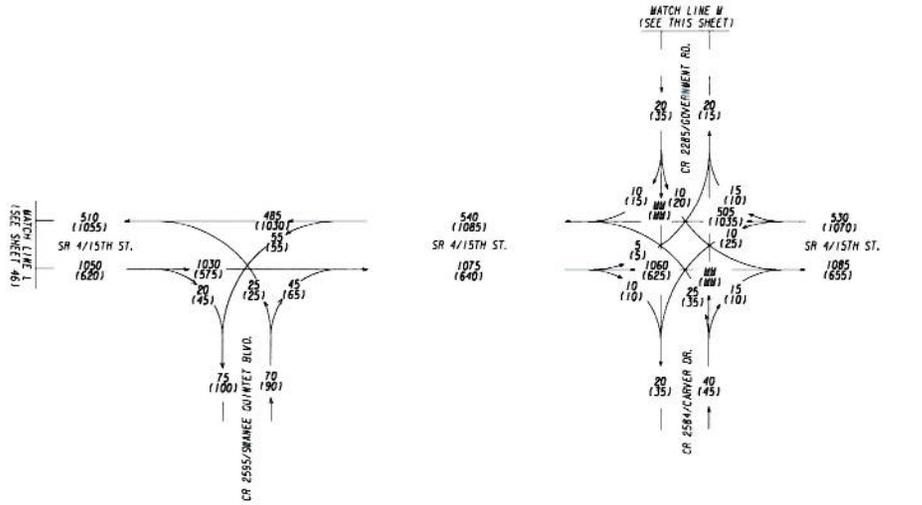
505 (1055)
SR 4/15TH ST.
1055 (620)



510 (1055)
SR 4/15TH ST.
1050 (620)

SR 4/15TH ST.
T = 13%
S.U. = 10.5%
COMB. = 2.5%

STP00-0043-0(57)
P.I. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2040 AM DHV = 000
2040 PM DHV = (000)

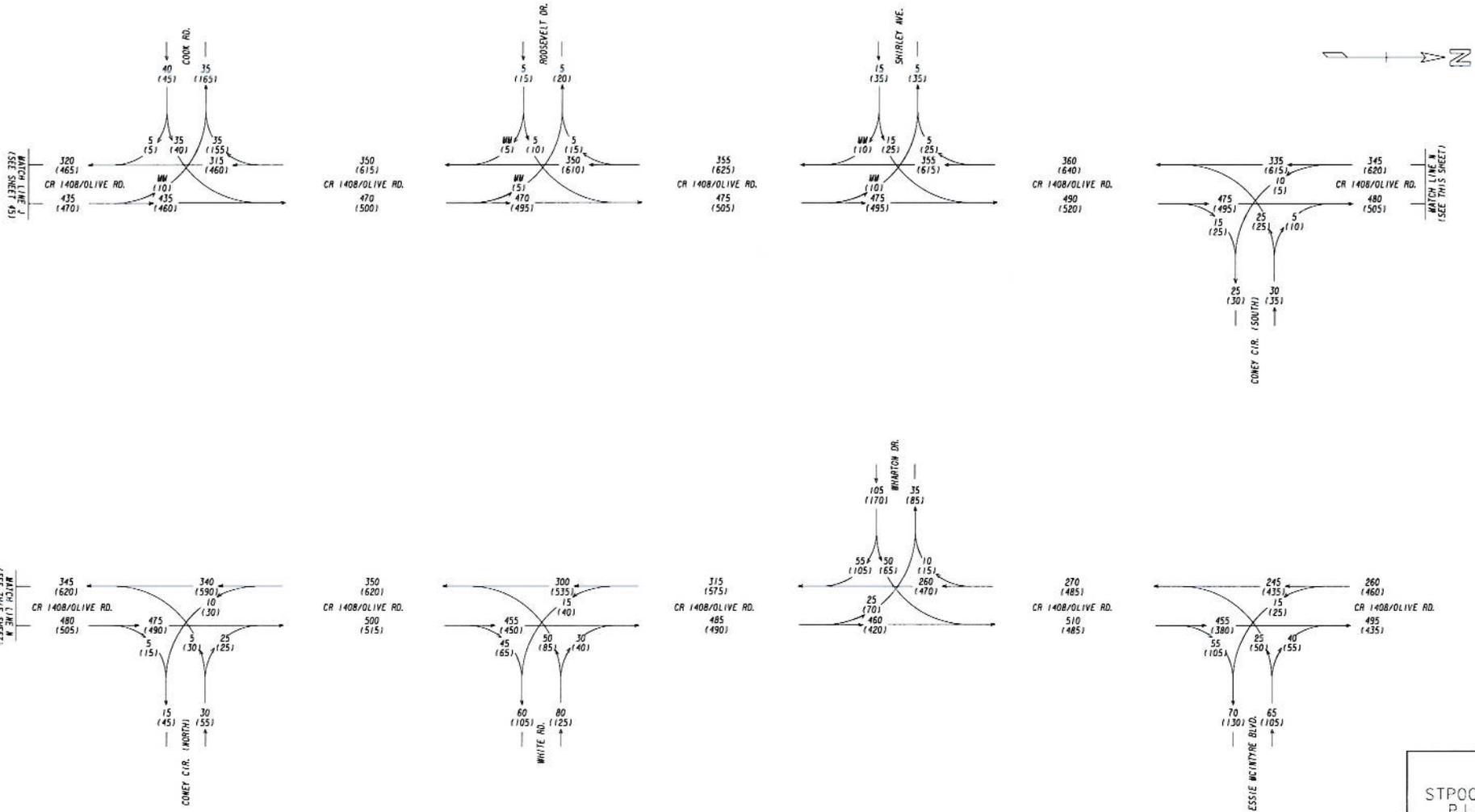


SR 4/15TH ST.
T = 13%
S.U. = 10.5%
COMB. = 2.5%

STP00-0043-01(57)
P.J. # 220680
RICHMOND COUNTY

SR 4
ALT. A
2040 AM DHV = 000
2040 PM DHV = (000)

FH
7/13



OLIVE RD.
T = 5%
S.U. = 4.5%
COMB. = 0.5%

STP00-0043-01(57)
P.L. # 220680
RICHMOND COUNTY
SR 4
ALT. A
2040 AM DHV = 000
2040 PM DHV = (000)
FH
7/13