

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**OFFICE OF DESIGN POLICY & SUPPORT  
INTERDEPARTMENTAL CORRESPONDENCE**

**FILE** P.I. # M003308 **OFFICE** Design Policy & Support  
CSNHS-M003-00(308)  
Carroll County  
GDOT District 6 - Cartersville **DATE** 11/13/2015  
I-20 from SR1/US27 to SR61 Pavement  
Rehabilitation

**FROM**  Brent Story, State Design Policy Engineer

**TO** SEE DISTRIBUTION

**SUBJECT** APPROVED REVISED CONCEPT REPORT

Attached is the approved Revised Concept Report for the above subject project.

Attachment

**DISTRIBUTION:**

Glenn Bowman, Director of Engineering  
Joe Carpenter, Director of P3/Program Delivery  
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery  
Albert Shelby, State Program Delivery Engineer  
Darryl VanMeter, State Innovative Delivery Engineer  
Bobby Hilliard, Program Control Administrator  
Cindy VanDyke, State Transportation Planning Administrator  
Hiral Patel, State Environmental Administrator  
Bill DuVall & Lyn Clements, for State Bridge Engineer  
Andrew Heath, State Traffic Engineer  
Angela Robinson, Financial Management Administrator  
Lisa Myers, State Project Review Engineer  
Charles "Chuck" Hasty, State Materials Engineer  
Lee Upkins, State Utilities Engineer  
Richard Cobb, Statewide Location Bureau Chief  
Andy Casey, State Roadway Design Engineer  
Attn: Mac Cranford, Design Group Manager  
DeWayne Comer, District Engineer  
David Acree, District Preconstruction Engineer  
Jun Birnkammer, District Utilities Engineer  
Nicole Law, Project Manager  
BOARD MEMBER - 3rd Congressional District

DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA

REVISED PROJECT CONCEPT REPORT

Project Type: Pavement Reconstruction P.I. Number: M003308  
GDOT District: Six County: Carroll  
Federal Route Number: I-20 State Route Number: 402  
Project Number: CSNHS-M003-00(308)

This project will replace the existing pavement along I-20/SR 402 from SR 1/US 27 to SR 61 with 12" thick Jointed Plain Concrete Pavement, 3" thick 19mm SP Interlayer and 12" GAB. The inside and outside shoulder will remain Hot Mix Asphalt over GAB.

Submitted for approval:

C. Andy Carty 9-17-15  
State Roadway Design Engineer Date

Albert Shultz 9-21-15  
State Program Delivery Engineer Date

Michael A. [Signature] 9-18-15  
GDOT Project Manager Date

Recommendation for approval:

Hiral Patel\* 10/04/2015  
State Environmental Administrator Date

Ken Werho\* 10/01/2015  
for State Traffic Engineer Date

Ben Rabun\* 10/26/2015  
State Bridge Engineer Date

- MPO Area: This project is consistent with the MPO adopted Regional Transportation Plan (RTP)/Long Range Transportation Plan (LRTP).
- Rural Area: This project is consistent with the goals outlined in the Statewide Transportation Plan (SWTP) and/or is included in the State Transportation Improvement Program (STIP).

Cynthia VanDyke\* 09/28/2015  
State Transportation Planning Administrator Date

\* Recommendation on file



## ENVIRONMENTAL AND PERMITS

**Potential environmental impacts of proposed revision:** There are no anticipated effects to the proposed schedule at this time, environmental surveys are not complete at this time, so effects are unknown.

**Have proposed revisions been reviewed by environmental staff?**     No     Yes

**Environmental responsibilities (Studies/Documents/Permits):** GDOT is responsible for the environmental studies/documents/permits

### 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

This project is exempt from conforming plan for PM 2.5 and Ozone.

### Environmental Comments and Information:

**NEPA:** Environmental document, a PCE environmental document is expected based on the described revisions.

**Ecology:** The ecology survey is not complete and effects have not been determined at this time.

**Archeology:** The project revision is not expected to require additional surveys for archaeology.

**History:** This project revision is not expected to require additional surveys for history.

**Air Quality:** This project revision is not expected to require additional modeling.

**Noise Effects:** These revisions are not expected to affect the noise impacts of the project.

**Public Involvement:** These revisions will not require additional public outreach.

**Recommendation:** Recommend that the proposed revision to the concept be approved for implementation.

**Comments:** None.

### Attachments:

1. Location map
2. Typical Section
3. Updated Cost Estimate(s)
4. Pavement Design

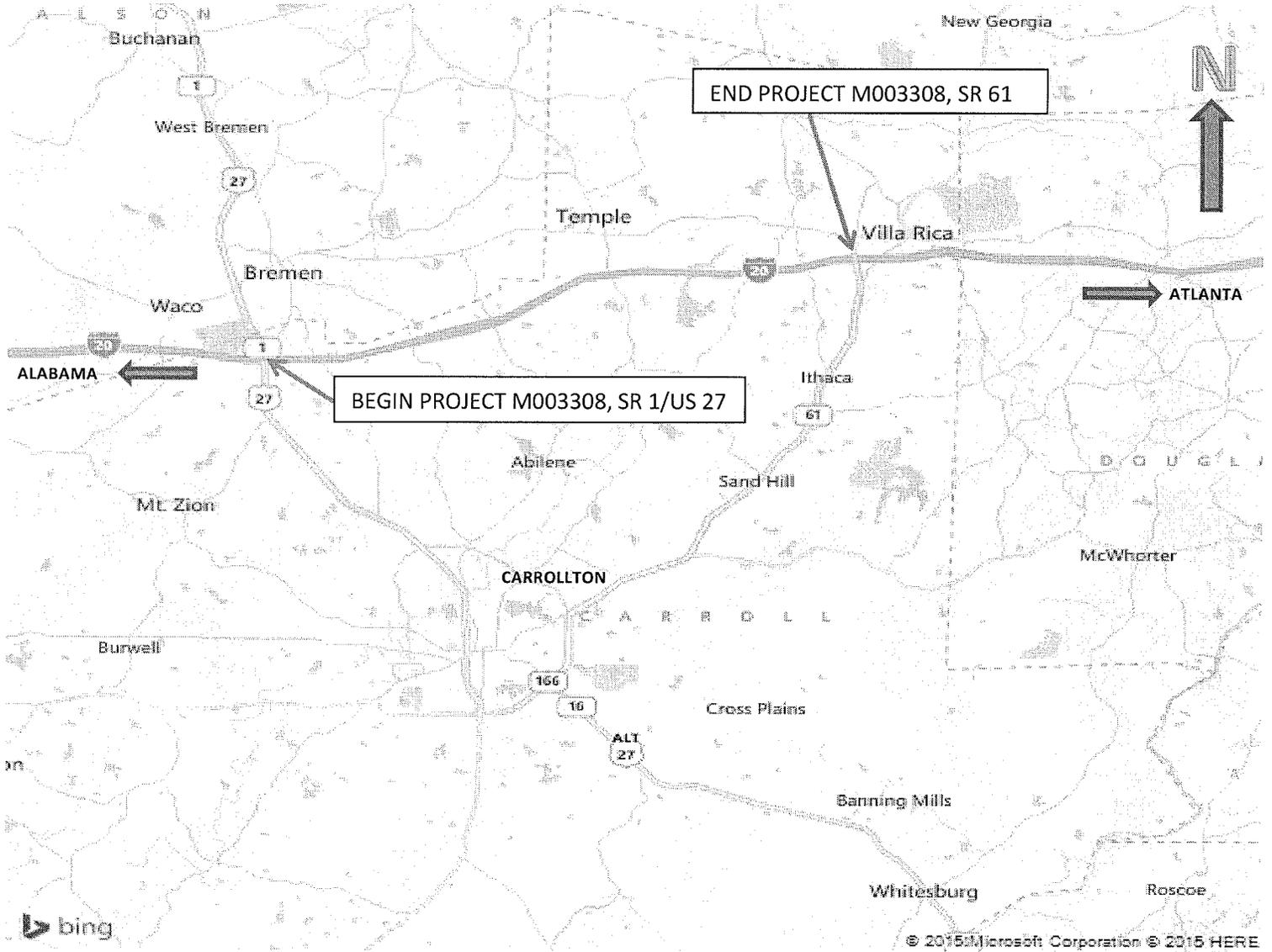
## APPROVALS

Concur:   
Director of Engineering

Approve:   
Chief Engineer

11.4.15  
Date

### Attachment #1 Project Location Map





**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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INTERDEPARTMENT CORRESPONDENCE

**FILE** P.I. No. M003308

**OFFICE** Program Delivery

**PROJECT DESCRIPTION**

I-20 from SR 1/US 27 to SR 61

**DATE** September 17, 2015

**From:** Albert V. Shelby III, State Program Delivery Engineer *Kimberly Nesbitt for*

**To:** Lisa L. Myers, State Project Review Engineer

**Subject:** REVISIONS TO PROGRAMMED COSTS

**PROJECT MANAGER** Nicole Law

**MGMT LET DATE** 8/15/2018

**MGMT ROW DATE** 11/15/2016

**PROGRAMMED COSTS (TPro W/OUT INFLATION)**

**LAST ESTIMATE UPDATE**

**CONSTRUCTION** \$ 47,628,000.00

**DATE** 7/17/2015

**RIGHT OF WAY** \$ N/A

**DATE**

**UTILITIES** \$ N/A

**DATE**

**REVISED COST ESTIMATES**

**CONSTRUCTION\*** \$ 74,692,542.11

**RIGHT OF WAY** \$

**UTILITIES** \$

\*Cost Contains 5 % Contingency

**REASONS FOR COST INCREASE AND CONTINGENCY JUSTIFICATION:**

The cost estimate was updated in order to balance the STIP and after the PDC determined the correct payment to be used. It contains 5% increase based off the type of project and the fact that the project will be in April letting so we are moving towards final design.

# CONTINGENCY SUMMARY

A. CONSTRUCTION COST ESTIMATE:	\$	65,267,104.66	Base Estimate From CES
B. ENGINEERING AND INSPECTION (E & I):	\$	3,263,355.23	Base Estimate (A) x <span style="border: 1px solid black; padding: 2px 10px;">5</span> %
C. CONTINGENCY:	\$	3,426,522.99	Base Estimate (A) + E & I (B) x <span style="border: 1px solid black; padding: 2px 10px;">5</span> % <u>See % Table in "Risk Based Cost Estimation" Memo</u>
D. TOTAL LIQUID AC ADJUSTMENT:	\$	2,735,559.22	Total From Liquid AC Spreadsheet
E. CONSTRUCTION TOTAL:	\$	74,692,542.11	(A + B + C + D = E)

## REIMBURSABLE UTILITY COSTS

UTILITY OWNER	REIMBURSABLE COST
<b>TOTAL</b>	\$ -

**ATTACHMENTS:**

Detailed Cost Estimate from TRAQS Liquid AC Adjustment
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# DETAILED COST ESTIMATE



**Job: M003308**

**JOB NUMBER** M003308

**FED/STATE PROJECT NUMBER**

**SPEC YEAR:** 13

**DESCRIPTION:** I-20 FROM SR 1/US 27 TO SR 61

**ITEMS FOR JOB M003308**

**1 - ROADWAY ITEMS**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0005	150-1000	1.000	LS	\$3,000,000.00000	TRAFFIC CONTROL - CSNHS-M003-00(308)	\$3,000,000.00
0010	150-5010	8.000	EA	\$9,690.86000	TRAF CTRL,PORTABLE IMPACT ATTN	\$77,526.88
0015	150-9011	6000.000	HR	\$49.25000	TR CT-WORKZONE LAW ENF-CTR BIDS	\$295,500.00
0020	153-1300	1.000	EA	\$70,113.24000	FIELD ENGINEERS OFFICE TP 3	\$70,113.24
0040	210-0100	1.000	LS	\$9,000,000.00000	GRADING COMPLETE - CSNHS-M003-00(308)	\$9,000,000.00
0045	310-1101	276519.000	TN	\$22.46000	GR AGGR BASE CRS, INCL MATL	\$6,210,616.74
3668	402-3121	2541.000	TN	\$79.52234	RECYL AC 25MM SP,GP1/2,BM&HL	\$202,066.27
0055	402-3190	61226.000	TN	\$61.68886	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	\$3,776,962.14
0065	407-0020	20000.000	LF	\$7.26000	ASPH-RUB JOINT/CRACK SEAL TP S	\$145,200.00
3663	430-0220	365828.000	SY	\$50.00000	PLN PC CONC PVMT/CL1C/ 12 TK	\$18,291,400.00
0075	430-0630	100.000	LF	\$81.42000	REINFORCED CONCRETE LUG ANCHORS	\$8,142.00
0085	431-1000	365828.000	SY	\$9.57000	GRIND CONC PVMT	\$3,500,973.96
0090	433-1200	2160.000	SY	\$161.49000	REF CONC APPR SLI/ SLOPED EDGE	\$348,818.40
0095	436-1000	9500.000	LF	\$9.89000	ASPH CONC CURB - 5 INCH	\$93,955.00
0130	456-2012	45.000	GLM	\$2,396.60000	INTENT. RUMB. STRIPS - GRND-IN-PL (CONT)	\$107,847.00
0140	500-0100	2160.000	SY	\$6.00000	GROOVED CONCRETE	\$12,960.00
0145	500-3200	10.000	CY	\$532.01000	CL B CONC	\$5,320.10
0150	550-1180	2000.000	LF	\$41.99000	STM DR PIPE 18,H 1-10	\$83,980.00
0155	550-3518	8.000	EA	\$705.81000	SAFETY END SECTION 18,STD,6:1	\$5,646.48
0180	620-0100	66000.000	LF	\$31.26000	TEMP BARRIER, METHOD NO. 1	\$2,063,160.00
0185	632-0003	10.000	EA	\$8,913.26000	CHANGEABLE MESS SIGN,PORT,TP 3	\$89,132.60
0190	641-1100	284.000	LF	\$56.16000	GUARDRAIL, TP T	\$15,949.44
0195	641-1200	30650.000	LF	\$18.01000	GUARDRAIL, TP W	\$552,006.50
0200	641-5001	38.000	EA	\$671.58000	GUARDRAIL ANCHORAGE, TP 1	\$25,520.04
0205	641-5006	4.000	EA	\$525.18000	GUARDRAIL ANCHORAGE, TP 6	\$2,100.72
0210	641-5012	72.000	EA	\$1,882.97000	GUARDRAIL ANCHORAGE, TP 12	\$135,573.84
<b>SUBTOTAL FOR ROADWAY ITEMS:</b>						<b>\$48,120,471.35</b>

**2 - OUTSIDE SHOULDER - ALTERNATE 1**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0054	310-1101	163864.000	TN	\$17.51602	GR AGGR BASE CRS, INCL MATL	\$2,870,245.10
0215	402-3121	78370.000	TN	\$68.43000	RECYL AC 25MM SP,GP1/2,BM&HL	\$5,362,859.10
0220	402-3130	19592.000	TN	\$80.67000	RECYL AC 12.5MM SP,GP2,BM&HL	\$1,580,486.64
0060	402-3190	39185.000	TN	\$72.88000	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	\$2,855,802.80
0230	413-0750	20023.000	GL	\$2.69000	TACK COAT	\$53,861.87
<b>SUBTOTAL FOR OUTSIDE SHOULDER - ALTERNATE 1:</b>						<b>\$12,723,255.51</b>

# DETAILED COST ESTIMATE



**Job: M003308**

**4 - EROSION CONTROL**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0265	163-0232	135.000	AC	\$419.01000	TEMPORARY GRASSING	\$56,566.35
0270	163-0240	500.000	TN	\$251.65000	MULCH	\$125,825.00
0025	163-0300	6.000	EA	\$1,498.28000	CONSTRUCTION EXIT	\$8,989.68
0500	163-0528	5000.000	LF	\$2.00000	CONSTR AND REM FAB CK DAM -TP C SLT FN	\$10,000.00
0505	163-0529	4000.000	LF	\$3.50768	CNST/REM TEMP SED BAR OR BLD STRW CK DM	\$14,030.72
0290	163-0550	99.000	EA	\$204.97000	CONS & REM INLET SEDIMENT TRAP	\$20,292.03
0295	165-0010	62500.000	LF	\$1.15000	MAINT OF TEMP SILT FENCE, TP A	\$71,875.00
0300	165-0030	187500.000	LF	\$1.25000	MAINT OF TEMP SILT FENCE, TP C	\$234,375.00
0510	165-0041	4500.000	LF	\$1.19162	MAINT OF CHECK DAMS - ALL TYPES	\$5,362.29
0030	165-0101	6.000	EA	\$541.24000	MAINT OF CONST EXIT	\$3,247.44
0315	167-1000	2.000	EA	\$756.25000	WATER QUALITY MONITORING AND SAMPLING	\$1,512.50
0320	167-1500	36.000	MO	\$771.93000	WATER QUALITY INSPECTIONS	\$27,789.48
0325	171-0010	125000.000	LF	\$2.30000	TEMPORARY SILT FENCE, TYPE A	\$287,500.00
0330	171-0030	375000.000	LF	\$3.51000	TEMPORARY SILT FENCE, TYPE C	\$1,316,250.00
0335	603-2180	50.000	SY	\$45.71000	STN DUMPED RIP RAP, TP 3, 12	\$2,285.50
0340	603-7000	50.000	SY	\$4.46000	PLASTIC FILTER FABRIC	\$223.00
0345	643-8200	18000.000	LF	\$2.51000	BARRIER FENCE (ORANGE), 4 FT	\$45,180.00
0350	700-6910	270.000	AC	\$866.78000	PERMANENT GRASSING	\$234,030.60
0355	700-7000	810.000	TN	\$72.23000	AGRICULTURAL LIME	\$58,506.30
0365	700-8000	270.000	TN	\$426.08000	FERTILIZER MIXED GRADE	\$115,041.60
0370	700-8100	13500.000	LB	\$3.38000	FERTILIZER NITROGEN CONTENT	\$45,630.00
0375	716-2000	76100.000	SY	\$1.34000	EROSION CONTROL MATS, SLOPES	\$101,974.00
<b>SUBTOTAL FOR EROSION CONTROL:</b>						<b>\$2,786,486.49</b>

# DETAILED COST ESTIMATE



**Job: M003308**

**5 - SIGNING AND MARKING**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0400	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD1	\$350.00
0410	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD2	\$350.00
0415	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD3	\$350.00
0420	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD4	\$350.00
0425	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD5	\$350.00
0430	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD6	\$350.00
0435	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD7	\$350.00
0440	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD8	\$350.00
0445	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD9	\$350.00
0450	610-9000	1.000	LS	\$350.00000	REM SIGN, STA - TBD10	\$350.00
0405	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD	\$2,500.00
0455	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD2	\$2,500.00
0460	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD3	\$2,500.00
0465	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD4	\$2,500.00
0470	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD5	\$2,500.00
0475	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD6	\$2,500.00
0480	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD7	\$2,500.00
0485	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD8	\$2,500.00
0490	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD9	\$2,500.00
0495	611-5550	1.000	LS	\$2,500.00000	RESET SIGN, STA - TBD10	\$2,500.00
3673	636-1033	15.000	SF	\$26.06024	HWY SIGNS, TP1MAT,REFL SH TP 9	\$390.90
3678	636-1041	190.000	SF	\$33.32577	HWY SIGNS,TP 2MAT,REFL SH TP 9	\$6,331.90
0255	636-2080	310.000	LF	\$10.47000	GALV STEEL POSTS, TP 8	\$3,245.70
0260	636-3010	20.000	EA	\$537.50000	GROUND-MOUNTED BREAKAWAY SIGN SUPPORT	\$10,750.00
0380	657-1104	5016.000	LF	\$6.96000	PRF PL SD PVMT MKG,10,WH,TPPB	\$34,911.36
0385	657-2085	25.000	LM	\$25,252.85000	PRF PL SD PVMT MKG,8,B/W,TPPB	\$631,321.25
0390	657-4085	24.000	GLM	\$13,460.30000	PRF PL SK PVMT MKG,8,B/W,TPPB	\$323,047.20
0395	657-7085	25.000	LM	\$23,935.72000	PRF PL SD PVMT MKG,8,B/Y,TPPB	\$598,393.00
<b>SUBTOTAL FOR SIGNING AND MARKING:</b>						<b>\$1,636,891.31</b>

**TOTALS FOR JOB M003308**

ITEMS COST:	\$65,267,104.66
COST GROUP COST:	\$0.00
ESTIMATED COST:	\$65,260,381.86
CONTINGENCY PERCENT:	0.00
ENGINEERING AND INSPECTION:	0.00
ESTIMATED COST WITH CONTINGENCY AND E&I:	\$65,260,381.86

PROJ. NO. CSNHS-M003-00(308)  
 P.I. NO. M003308  
 DATE 9/17/2015

CALL NO.

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Sep-15	\$ 2.289
DIESEL		\$ 2.569
LIQUID AC		\$ 450.00

Link to Fuel and AC Index:  
<http://www.dot.ga.gov/PS/Materials/AsphaltFuelIndex>

**LIQUID AC ADJUSTMENTS**

PA=[((APM-APL)/APL)]xTMTxAPL

**Asphalt**

Price Adjustment (PA)				<b>2712339</b>	\$	<b>2,712,339.00</b>
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	720.00		
Monthly Asphalt Cement Price month project let (APL)			\$	450.00		
<b>Total Monthly Tonnage of asphalt cement (TMT)</b>				<b>10045.7</b>		

ASPHALT	Tons	%AC	AC ton
Leveling		5.0%	0
12.5 OGFC		5.0%	0
12.5 mm	19592	5.0%	979.6
9.5 mm SP		5.0%	0
25 mm SP	80911	5.0%	4045.55
19 mm SP	100411	5.0%	5020.55
	<b>200914</b>		<b>10045.7</b>

**BITUMINOUS TACK COAT**

Price Adjustment (PA)			\$	<b>23,220.22</b>	\$	<b>23,220.22</b>
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	720.00		
Monthly Asphalt Cement Price month project let (APL)			\$	450.00		
<b>Total Monthly Tonnage of asphalt cement (TMT)</b>				<b>86.00080576</b>		

Bitum Tack

Gals	gals/ton	tons
20023	232.8234	86.0008058

**BITUMINOUS TACK COAT (surface treatment)**

Price Adjustment (PA)			\$	<b>0</b>	\$	<b>-</b>
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	\$	720.00		
Monthly Asphalt Cement Price month project let (APL)			\$	450.00		
<b>Total Monthly Tonnage of asphalt cement (TMT)</b>				<b>0</b>		

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

**TOTAL LIQUID AC ADJUSTMENT** \$ **2,735,559.22**

## Flexible Pavement Design Analysis

PI Number	M003308	County(s)	Carroll
Project Number	N/A	Design Name	Temporary Pavement for Crossover
Project Description	I-20 Reconstruction from East of SR 1/US 27 to SR 61		

Traffic Data (AADTs are one-way)					Miscellaneous Data		
Initial Design Year	2016	Initial AADT, VPD	19,195	24 Hour Truck %	31.00	Lanes in one direction	1
Final Design Year	2018	Final AADT, VPD	19,800	SU Truck %	4.50	Curb & Gutter/Barrier	No
		Mean AADT, VPD	19,498	MU Truck %	26.50		

Design Data					
Lane Distribution Factor (%)	70.00	Soil Support Value	2.50	Single Unit ESAL	0.40
Terminal Serviceability Index	2.00	Regional Factor	1.80	Multiple Unit ESAL	1.50
		User Defined 18-KIP ESAL	0.00	Calculated 18-KIP ESAL	1.34
Non-Standard Value Comment	Terminal Serviceability Index lowered to 2.00 for temporary pavement that will be removed.				

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
19,498	70.00	Single Unit Truck	4.50	0.40	246
		Multi Unit Truck	26.50	1.50	5,426
Total Daily ESALs					5,672
Total Design Period ESALs					4,140,560

Proposed Flexible Full Depth Pavement Structure				
Course	Material	Thickness (inches)	Structural Coefficient	Structural Value
Course 1	12.5 mm Superpave	1.50	0.4400	0.66
Course 2	19 mm Superpave	2.00	0.4400	0.88
Course 3	25 mm Superpave	1.00	0.4400	0.44
		2.00	0.3000	0.60
Course 4	Graded Aggregate Base	12.00	0.1600	1.92
Required SN	5.25	Proposed pavement is 14.24% Underdesigned		Proposed SN
				4.50

Design Remarks	One lane temporary crossover for contra flow. Should be limited to vehicles other than trucks but design analysis allows for 70% trucks.
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Prepared By Yun Tang 9/1/2015 9:49 AM  
 Yun Tang Civil Engineer 4 Date

Recommended By De Rebele 9/15/2015  
 State Roadway Design Engineer Date

Approved By [Signature] 9/23/2015  
 State Pavement Engineer Date

## Flexible Pavement Design Analysis

PI Number	M003308	County(s)	Carroll
Project Number	N/A	Design Name	Inside and Outside Shoulders
Project Description	I-20 Reconstruction from East of SR 1/US 27 to SR 61		

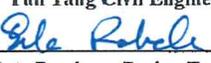
Traffic Data (AADTs are one-way)					Miscellaneous Data		
Initial Design Year	2016	Initial AADT, VPD	19,195	24 Hour Truck %	31.00	Lanes in one direction	1
Final Design Year	2018	Final AADT, VPD	19,800	SU Truck %	4.50	Curb & Gutter/Barrier	No
		Mean AADT, VPD	19,498	MU Truck %	26.50		

Design Data					
Lane Distribution Factor (%)	100.00	Soil Support Value	2.50	Single Unit ESAL	0.40
Terminal Serviceability Index	2.50	Regional Factor	1.80	Multiple Unit ESAL	1.50
		User Defined 18-KIP ESAL	0.00	Calculated 18-KIP ESAL	1.34
Non-Standard Value Comment					

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
19,498	100.00	Single Unit Truck	4.50	0.40	351
		Multi Unit Truck	26.50	1.50	7,751
Total Daily ESALs					8,102
Total Design Period ESALs					5,914,460

Proposed Flexible Full Depth Pavement Structure					
Course	Material	Thickness (inches)	Structural Coefficient	Structural Value	
Course 1	12.5 mm Superpave	1.50	0.4400	0.66	
Course 2	19 mm Superpave	2.00	0.4400	0.88	
Course 3	25 mm Superpave	1.00	0.4400	0.44	
		6.00	0.3000	1.80	
Course 4	Graded Aggregate Base	12.00	0.1600	1.92	
Required SN	5.92	Proposed pavement is 3.75% Underdesigned		Proposed SN	5.70

Design Remarks	Permanent shoulders used for maintenance of traffic during stage construction - assumes trucks will be directed by signage to remain in right lane.
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Prepared By	 Yun Tang Civil Engineer 4	9/1/2015 9:22 AM Date
Recommended By	 Dale Roberts State Roadway Design Engineer	9/15/2015 Date
Approved By	 State Pavement Engineer	9/23/2015 Date

Rigid Pavement Design Analysis					
PI Number	M003308	County(s)	Carroll		
Project Number	N/A	Design Name	I-20 JPCP		
Project Description	I-20 Reconstruction from East of SR 1/US 27 to SR 61				
Section Location	I-20 Mainline - 2 Lanes in Each Direction			Type Section	JPCP
Begin Section Station	N/A	End Section Station	N/A	Section Length	11+ Miles

Traffic Data (AADTs are one-way)					Miscellaneous Data		
Initial Design Year	2018	Initial AADT, VPD	19,800	24 Hour Truck %	31.00	Lanes in one direction	2
Final Design Year	2038	Final AADT, VPD	25,850	SU Truck %	4.50	Curb & Gutter/Barrier	No
		Mean AADT, VPD	22,825	MU Truck %	26.50	Interstate	Yes

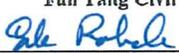
Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
22,825	90	Other Vehicles	69.00	0.004	57
		Single Unit Truck	4.50	0.500	463
		Multi Unit Truck	26.50	2.680	14,590
Total Daily ESALs					15,110
Total Design Period ESALs					110,303,000

Design Data							
Terminal Serviceability Index (P <sub>t</sub> )	2.50	Working Stress (psi)	450	Modulus of Elasticity (psi)	3,200,000		
Soil Support Value	2.50	Subgrade Modulus (k)	130	Subbase Modulus (k <sub>s</sub> )	225	Subbase Modulus (k <sub>sub</sub> )	280
Trial Depth of PCC Pavement (inches)			12.00	Calculated Stress from Equation (psi)		643.58	
% Overstressed		43.02	% Underdesigned		30.08	Balanced Thickness (inches)	
Non-Standard Value Comment							

Proposed Rigid Pavement Structure	
Material	Thickness (inches)
JPCP - Jointed Portland Cement Concrete Pavement	12.00
19 mm Superpave Asphaltic Concrete Interlayer	3.00
Graded Aggregate Base	12.00

JPCP - Dowel Bar Size and Spacing
Refer to GDOT Standard 5046H: Joint Details for Portland Cement Concrete Paving

Design Remarks	
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Prepared By	 Yun Tang Civil Engineer 4	9/1/2015 9:16 AM
Recommended By	 for State Roadway Design Engineer	9/15/2015
Approved By	 State Pavement Engineer	9/23/2015