DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE PI No. 0010925 Fulton County
Riverside Drive at I-285 Interchange Improvements

OFFICE Materials & Testing
Forest Park, Georgia

DATE July 15, 2014

FROM Charles A. Hasty, P.E., State Materials Engineer

TO Darryl VanMeter, P.E., Office of Innovative Program Delivery
Attention: Marlo Clowers, P.E., Senior Project Manager

SUBJECT **Pavement Type Selection**
Riverside Drive at I-285

Your request for a Pavement Type Selection report on the aforementioned project has been reviewed. Based on the limited scope/length of the project, the existing pavement types, and the condition of the existing pavement, a pavement evaluation is not warranted. The pavement type for the widening sections should match the existing pavement type. For Riverside Drive in which the existing pavement type consists of Asphalt, the pavement type used for widening should also consist of Asphalt. For the Ramps in which the existing pavement type consists of Concrete, the pavement type used for widening should also consist of Concrete. Included are two (2) full-depth designs for the widening sections - one full depth design for Asphalt and one full depth design for Concrete.

If additional information is needed, please contact James Turner of the Geotechnical Environmental Pavement Bureau at (404) 608-4776.

CAH: JHT
Attachments
- Full-Depth Flexible Design – Riverside Drive
- Full-Depth Rigid Design – Ramps
- Project Location Map

File

Flexible Pavement Design Analysis

PI Number	0010925	**County(s)**	Fulton (north)
Project Number	N/A	**Design Name**	Riverside Drive Full Depth Pavement
Project Description	Riverside Drive Roundabout Interchange Improvements at I-285		

Traffic Data (AADTs are one-way)

Initial Design Year	2015	**Initial AADT, VPD**	9,765	**24 Hour Truck %**	8.00	**Lanes in one direction**	1
Final Design Year	2035	**Final AADT, VPD**	10,790	**SU Truck %**	7.00	**Curb & Gutter/Barrier**	Yes
		Mean AADT, VPD	10,278	**MU Truck %**	1.00		

Miscellaneous Data

Design Data

Lane Distribution Factor (%)	100.00	**Soil Support Value**	2.00	**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**	0.54

Non-Standard Value Comment As no soil survey has been performed Soil Support Value and Regional Factor were determined from typical county values taken from Appendix G & H of the Pavement Design Manual.

Design Loading (Calculated 18-KIP ESAL)

Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
10,278	100.00	Single Unit Truck	7.00	0.40	288
		Multi Unit Truck	1.00	1.50	155
				Total Daily ESALs	443
				Total Design Period ESALs	3,233,900

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	5.79	**Proposed pavement is 1.55% Underdesigned**	**Proposed SN**	5.70

Design Remarks Full Depth pavement will be utilized for widening, primarily in the form of right turn lanes for the interchange approaches

Prepared By Ryan Graves, PE - ARCADIS Project Engineer — 5/16/2014 10:23 AM **Date**

Recommended By Consultant Design Phase Leader — 5/16/14 **Date**

Approved By State Pavement Engineer — 7/9/14 **Date**

Filename G:\Tra\GDOT I-285\Riverside\RDY\Pavement Design\GDOT Pavement Design Tool v2.0.xlsm
GDOT Pavement Design Tool - Version 2.0

Rigid Pavement Design Analysis

PI Number	0010925	County(s)	Fulton (north)
Project Number	N/A	Design Name	Full Depth Ramp Pavement
Project Description	Riverside Drive Roundabout Interchange Improvements at I-285		
Section Location	Developed using volumes for the eastbound entrance ramp	Type Section	JPCP
Begin Section Station	60+91	End Section Station	63+55
Section Length	264		

Traffic Data (AADTs are one-way)

Initial Design Year	2015	Initial AADT, VPD	5,015	24 Hour Truck %	10.50	Lanes in one direction	1
Final Design Year	2035	Final AADT, VPD	5,540	SU Truck %	9.50	Curb & Gutter/Barrier	Yes
		Mean AADT, VPD	5,278	MU Truck %	1.00	Interstate	Yes

Miscellaneous Data

Design Loading (Calculated 18-KIP ESAL)

Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
		Other Vehicles	89.50	0.004	19
5,278	100	Single Unit Truck	9.50	0.500	251
		Multi Unit Truck	1.00	2.680	142
				Total Daily ESALs	412
				Total Design Period ESALs	3,007,600

Design Data

Terminal Serviceability Index (P_t) 2.50 Working Stress (psi) 450 Modulus of Elasticity (psi) 3,200,000

Soil Support Value 2.00 Subgrade Modulus (k) 110 Subbase Modulus (k_1) 175 Subbase Modulus (k_{eff}) 225

Trial Depth of PCC Pavement (inches) 9.00 Calculated Stress from Equation (psi) 385.92

% Understressed 14.24 % Overdesigned 16.60 Balanced Thickness (inches) 8.22

Non-Standard Value Comment: No soil survey performed - Soil Support Value and Subgrade Modulus taken from typical county values published in the Pavement Design Manual

Proposed Rigid Pavement Structure

Material	Thickness (inches)
JPCP - Jointed Portland Cement Concrete Pavement	9.00
19 mm Superpave Asphaltic Concrete Interlayer	3.00
Graded Aggregate Base	10.00

JPCP - Dowel Bar Size and Spacing

Refer to GDOT Standard 5046H:
Joint Details for Portland Cement Concrete Paving

Design Remarks

Prepared By: Ryan Graves, PE - ARCADIS Project Engineer — Date: 5/16/2014 10:23 AM

Recommended By: Consultant Design Phase Leader — Date: 5/16/2014

Approved By: State Pavement Engineer — Date: 7/9/14

Filename: G:\Tra\GDOT I-285\Riverside\RDY\Pavement Design\GDOT Pavement Design Tool v2.0.xlsm
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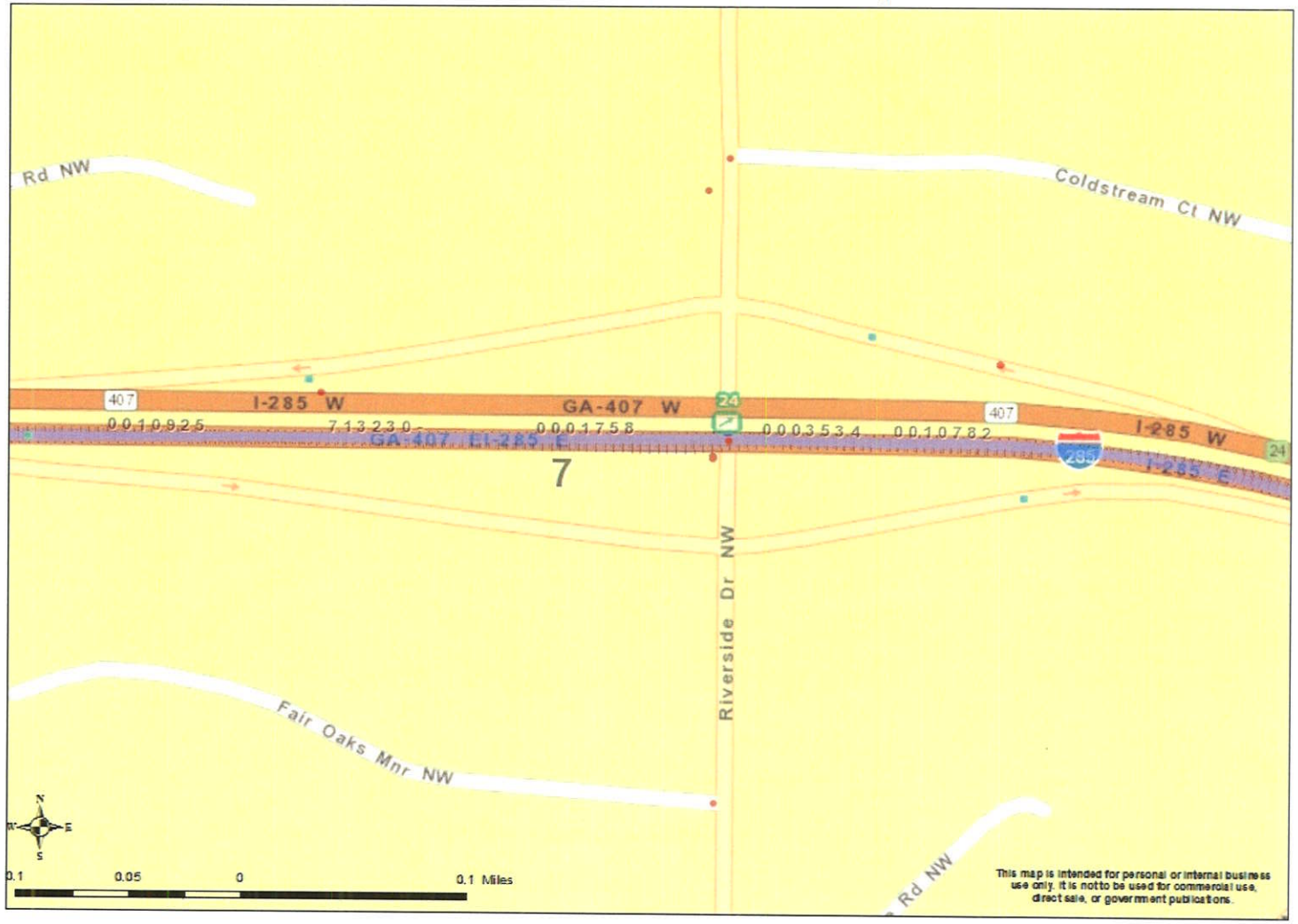
PI 0010925 _ Project Map



Materials and Testing: D0010925PTS