

Flexible Pavement Design Analysis

PI Number	0012722	County(s)	Chatham
Project Number	PI 0012722	Design Name	SR 21 and Ramps Full Depth
Project Description	SR 21 From SR 30 to I-95 Including Diverging Diamond Interchange		

Traffic Data (AADTs are one-way)						Miscellaneous Data	
Initial Design Year	2015	Initial AADT, VPD	23,665	24 Hour Truck %	15.00	Lanes in one direction	3
Final Design Year	2035	Final AADT, VPD	31,905	SU Truck %	9.00	Curb & Gutter/Barrier	No
		Mean AADT, VPD	27,785	MU Truck %	6.00		

Design Data					
Lane Distribution Factor (%)	70.00	Soil Support Value	3.50	Single Unit ESAL	0.40
Terminal Serviceability Index	2.50	Regional Factor	1.70	Multiple Unit ESAL	1.50
		User Defined 18-KIP ESAL	0.00	Calculated 18-KIP ESAL	0.84
Non-Standard Value Comment					

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
27,785	70.00	Single Unit Truck	9.00	0.40	701
		Multi Unit Truck	6.00	1.50	1,751
Total Daily ESALs					2,452
Total Design Period ESALs					17,899,600

Proposed Flexible Full Depth Pavement Structure					
Course	Material	Thickness (Inches)	Structural Coefficient	Structural Value	
Course 1	12.5 mm SMA	2.00	0.4400	0.88	
Course 2	19 mm Superpave, Polymer Modified	2.00	0.4400	0.88	
Course 3	25 mm Superpave	0.50	0.4400	0.22	
		5.50	0.3000	1.65	
Course 4	Graded Aggregate Base	12.00	0.1600	1.92	
Required SN	6.07	Proposed pavement is 8.61% Underdesigned		Proposed SN	5.55

Design Remarks	Full Depth throughout the project
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1/30/2015 9:27 AM

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Date

Recommended By

Andrew Henz

02/01/2015

Consultant Design Phase Leader - Andrew Henz

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Approved By

[Signature]
State Pavement Engineer

2/3/2015

Date

Flexible Pavement Design Analysis

PI Number	0012722	County(s)	Chatham
Project Number	PI 0012722	Design Name	SR 21 and Ramps Overlay
Project Description	SR 21 From SR 30 to I-95 Including Diverging Diamond Interchange		

Traffic Data (AADT's are one-way)						Miscellaneous Data	
Initial Design Year	2015	Initial AADT, VPD	23,665	24 Hour Truck %	15.00	Lanes in one direction	3
Final Design Year	2035	Final AADT, VPD	31,905	SU Truck %	9.00	Curb & Gutter/Barrier	No
		Mean AADT, VPD	27,785	MU Truck %	6.00	Milling Depth (inches)	1.00

Design Data					
Lane Distribution Factor (%)	70.00	Soil Support Value	3.50	Single Unit ESAL	0.40
Terminal Serviceability Index	2.50	Regional Factor	1.70	Multiple Unit ESAL	1.50
		User Defined 18-KIP ESAL	0.00	Calculated 18-KIP ESAL	0.84
Non-Standard Value Comment					

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
27,785	70.00	Single Unit Truck	9.00	0.40	701
		Multi Unit Truck	6.00	1.50	1,751
Total Daily ESALs					2,452
Total Design Period ESALs					17,899,600

Proposed Flexible Overlay Pavement Structure				
Course	Material	Thickness (inches)	Structural Coefficient	Structural Value
Overlay 1	12.5 mm SMA	2.00	0.4400	0.88
Overlay 2	19 mm Superpave, Polymer Modified	2.00	0.4400	0.88
Existing 1	Asphaltic Concrete	11.00	0.3000	3.30
Required SN	6.07	Proposed pavement is 16.68% Underdesigned		Proposed SN
				5.06

Design Remarks	Overlay for SR 21 and Ramps - Variable mill with 1" open graded crack relief with overlay
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Flexible Pavement Design Analysis

PI Number	0012722	County(s)	Chatham
Project Number	PI 0012722	Design Name	DDI Overlay
Project Description	SR 21 From SR 30 to I-95 Including Diverging Diamond Interchange		

Traffic Data (AADTs are one-way)						Miscellaneous Data	
Initial Design Year	2015	Initial AADT, VPD	23,665	24 Hour Truck %	15.00	Lanes in one direction	3
Final Design Year	2035	Final AADT, VPD	31,905	SU Truck %	9.00	Curb & Gutter/Barrier	No
		Mean AADT, VPD	27,785	MU Truck %	6.00	Milling Depth (inches)	5.00

Design Data					
Lane Distribution Factor (%)	70.00	Soil Support Value	3.50	Single Unit ESAL	0.40
Terminal Serviceability Index	2.50	Regional Factor	1.70	Multiple Unit ESAL	1.50
		User Defined 18-KIP ESAL	0.00	Calculated 18-KIP ESAL	0.84
Non-Standard Value Comment					

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	LDF (%)	Vehicle Type	Volume (%)	ESAL Factor	Daily ESAL
27,785	70.00	Single Unit Truck	9.00	0.40	701
		Multi Unit Truck	6.00	1.50	1,751
Total Daily ESALs					2,452
Total Design Period ESALs					17,899,600

Proposed Flexible Overlay Pavement Structure				
Course	Material	Thickness (inches)	Structural Coefficient	Structural Value
Overlay 1	12.5 mm SMA	2.00	0.4400	0.88
Overlay 2	19 mm Superpave, Polymer Modified	2.00	0.4400	0.88
Existing 1	Asphaltic Concrete	7.00	0.3000	2.10
Required SN	6.07	Proposed pavement is 36.44% Underdesigned		Proposed SN
				3.86

Design Remarks	Overlay for SR 21 within DDI - Variable mill with 1" open graded crack relief and 4" overlay
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