

PROPOSED DESIGN CRITERIA

STATE PROJECT: WBS 50120.1.1
F. A. PROJECT: NHPP-040-4(157)294
COUNTY: Wake
PROJECT DESCRIPTION: Reconstruct the I-40/I-440/US 1/US 64 Interchange

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DIVISION: 5
DATE: 1/18/2019
REVISION: 2/27/2019
 3/26/2019
 3/16/2020
 5/1/2020
 5/3/2021
 10/1/2021 & 10/27/2021

PREPARED BY: Atkins
CHECKED BY:

ROUTE	I-440/US 1/US 64	I-40	I-40	REFERENCE
LINE	-Y1-	-L1-	-L1-	OR REMARKS
TRAFFIC DATA				
ADT LET YR = 2022	153,000	150,200	150,200	Base Year No Build
ADT DESIGN YR = 2045	199,200	223,800	223,800	Future Year No Build
TTST	2%	4%	4%	with Managed Lanes
DUALS	3%	3%	3%	Traffic Forcast
D	55%	55%	55%	Approved September 2018
K	8%	8%	8%	
CLASSIFICATION	Interstate	Interstate	Interstate	NCDOT Func. Classification Map
TERRAIN TYPE	Rolling	Rolling	Rolling	RDM 1-1D
DESIGN SPEED km/hr or mph	70 mph	70 mph	70 mph	RDM 1-1B; GB 8-2
POSTED SPEED km/hr or mph	65 mph	65 mph	65 mph	
PROP. R/W WIDTH m or ft	Varies	Varies	Varies	
CONTROL OF ACCESS	Full	Full	Full	RDM Part II 9-1
RUMBLE STRIPS (Y/N)	Yes	Yes	Yes	
TYPICAL SECTION TYPE	6-Lane Divided, Shoulder	6-Lane Divided, Shoulder	8-Lane Divided, Shoulder	
LANE WIDTH m or ft	12 ft	12 ft	12 ft	GB 8-3
SIDEWALKS (Y/N)	No	No	No	
BICYCLE LANES (Y/N)	No	No	No	
MEDIAN WIDTH m or ft	Varies	Varies	Varies	RDM 1-6
MED. PROTECT. (GR/BARRIER)	Barrier	Depressed	Barrier	
SHOULDER WIDTH (total)				
MEDIAN m or ft	12 ft	12 ft	12 ft	RDM 1-4B, F-1; GB 8-3
OUTSIDE w/o GR m or ft	14 ft	14 ft	14 ft	RDM 1-4B, F-1; GB 8-3
OUTSIDE w/ GR m or ft	17 ft	17 ft	17 ft	RDM 1-4B, F-1; GB 8-3
PAVED SHOULDER				
OUTSIDE TOTAL/FDPS m or ft	12 ft	12 ft	12 ft	RDM 1-4O, F-1
MEDIAN TOTAL/FDPS m or ft	12 ft	12 ft	12 ft	RDM 1-4O, F-1
GRADE				
MAX.	4%	4%	4%	RDM 1-14; GB 8-4
MIN.	0.3%	0.3%	0.3%	GB 3-130
K VALUE				
SAG	181	181	181	GB 3-176, 3-37
CREST	247	247	247	GB 3-170, 3-35
HORIZ. ALIGN.				
MAX. SUPER.	8%	8%	8%	RDM 1-15
MIN. RADIUS m or ft	1810 ft	1810 ft	1810 ft	GB 3-45
SPIRAL (Y/N)	Yes	Yes	Yes	RDM 1-11
CROSS SLOPES				
PAVEMENT	2%	2%	2%	RDM 1-3B
PAVED SHOULDER	4%	4%	4%	STD. 560.02
TURF SHOULDER	4%	4%	4%	STD. 560.02
MEDIAN DITCH	N/A	6:1	N/A	RDM 1-2B, 1-4O, F-1A
DITCH TYPICAL (A,B)	A	A	A	RDM 1-2A, F-1
CLEAR ZONE m or ft	30 ft	30 ft	30 ft	RDM 1-4N; RDG 3-3
TYPICAL SECTION NO.	1	2	3	

NOTES:

Design values were obtained from "The 2018 AASHTO A Policy on Geometric Design of Highways and Streets" (GB), the 2012 NCDOT Roadway Design Manual (RDM), and 2018 NCDOT Standard Drawings (STD).

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ROUTE				REFERENCE
LINE	Loops	Flyover	Interstate Ramps	OR REMARKS
TRAFFIC DATA				
ADT LET YR = 2022	8,800 - 39,900	8,800 - 39,900	8,800 - 39,900	Base Year No Build
ADT DESIGN YR = 2045	16,800 - 54,100	16,800 - 54,100	16,800 - 54,100	Future Year No Build
TTST	4%	4%	4%	with Managed Lanes
DUALS	3%	3%	3%	Traffic Forecast
D	55%	55%	55%	Approved September 2018
K	8%	8%	8%	
CLASSIFICATION	Interstate	Interstate	Interstate	NCDOT Func. Classification Map
TERRAIN TYPE	Rolling	Rolling	Rolling	RDM 1-1D
DESIGN SPEED km/hr or mph	30 mph	50 mph	60 mph	GB 10-105, 10-106; RDM 8-3
POSTED SPEED km/hr or mph	N/A	N/A	N/A	
PROP. R/W WIDTH m or ft	Varies	Varies	Varies	
CONTROL OF ACCESS	Full	Full	Full	RDM Part II 9-1
RUMBLE STRIPS (Y/N)	No	No	No	
TYPICAL SECTION TYPE	1-Lane, Shoulder/C&G	2-Lane, Shoulder	1-Lane, Shoulder	
LANE WIDTH m or ft	20 ft	12 ft	16 ft	RDM 8-1, 8-2
SIDEWALKS (Y/N)	No	No	No	
BICYCLE LANES (Y/N)	No	No	No	
MEDIAN WIDTH m or ft	N/A	N/A	N/A	
MED. PROTECT. (GR/BARRIER)	N/A	N/A	N/A	
SHOULDER WIDTH (total)				
MEDIAN m or ft	10 ft Berm	12 ft	12 ft	RDM 1-4D, 1-4E; GB 10-121
OUTSIDE w/o GR m or ft	12 ft	14 ft	14 ft	RDM 1-7D, F-1; 1-4D, 1-4E, GB 10-121
OUTSIDE w/ GR m or ft	15 ft	17 ft	17 ft	RDM 1-7D, F-1; 1-4D, 1-4E, GB 10-121
PAVED SHOULDER				
OUTSIDE TOTAL/FDPS m or ft	4 ft	4 ft	4 ft	RDM 1-4O
MEDIAN TOTAL/FDPS m or ft	N/A	4 ft	4 ft	RDM 1-4O
GRADE				
MAX.	10 %	6 %	5 %	GB 10-109; RDM 8-4
MIN.	0.3 %	0.3 %	0.3 %	GB 3-130
K VALUE				
SAG	37	96	136	GB 3-176, 3-37
CREST	19	84	151	GB 3-170, 3-35
HORIZ. ALIGN.				
MAX. SUPER.	8%	6 %	8 %	RDM 1-15
MIN. RADIUS m or ft	230 ft	833 ft	1200 ft	GB 3-45; RDM 8-1, 8-3
SPIRAL (Y/N)	Yes	Yes	Yes	RDM 1-11
CROSS SLOPES				
PAVEMENT	2 %	2 %	2 %	RDM 1-3B
PAVED SHOULDER	2 %	2 %	2 %	STD. 560.02
TURF SHOULDER	4% (high)/8 % (low)	4% (high)/8 % (low)	4% (high)/8 % (low)	STD. 560.02
MEDIAN DITCH	N/A	N/A	N/A	
DITCH TYPICAL (A,B)	A	A	A	
CLEAR ZONE m or ft	18 ft	30 ft	30 ft	RDM 1-4N; RDG 3-3
TYPICAL SECTION NO.	4	5	6	

NOTES:

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ROUTE				REFERENCE
LINE	Ramps	CD	2-Lane Ramps	OR REMARKS
TRAFFIC DATA				
ADT LET YR = 2022	1,100 - 31,400	160 - 39,800	8,800 - 39,900	2045 Build Volumes
ADT DESIGN YR = 2045	1,900 - 41,300	240 - 41,300	16,800 - 54,100	from Field Counts & Forecast
TTST	1%	1%	4%	
DUALS	2%	2%	3%	
D	55%	55%	55%	
K	8%	8%	8%	
CLASSIFICATION				
TERRAIN TYPE	Interstate	Interstate	Interstate	NCDOT Func. Classification Map
DESIGN SPEED km/hr or mph	Rolling	Rolling	Rolling	RDM 1-1D
POSTED SPEED km/hr or mph	50 mph	60 mph	60 mph	GB 10-105; RDM 8-3
PROP. R/W WIDTH m or ft	N/A	N/A	N/A	
CONTROL OF ACCESS	Varies	Varies	Varies	
RUMBLE STRIPS (Y/N)	Full	Full	Full	RDM Part II 9-1
TYPICAL SECTION TYPE	No	No	No	
LANE WIDTH m or ft	1-Lane, Shoulder	1-Lane, Shoulder	2-Lane, Shoulder	
SIDEWALKS (Y/N)	16 ft	16 ft	12 ft	RDM 8-2
BICYCLE LANES (Y/N)	No	No	No	
MEDIAN WIDTH m or ft	No	No	No	
MED. PROTECT. (GR/BARRIER)	N/A	N/A	N/A	
SHOULDER WIDTH (total)				
MEDIAN m or ft	12 ft	12 ft	12 ft	RDM 1-4D, 1-4E; GB 10-121
OUTSIDE w/o GR m or ft	14 ft	14 ft	14 ft	RDM 1-4D, 1-4E; GB 10-121
OUTSIDE w/ GR m or ft	17 ft	17 ft	17 ft	RDM 1-4D, 1-4E; GB 10-121
PAVED SHOULDER				
OUTSIDE TOTAL/FDPS m or ft	4 ft	4 ft	4 ft	RDM 1-4O
MEDIAN TOTAL/FDPS m or ft	4 ft	4 ft	4 ft	RDM 1-4O
GRADE				
MAX.	5 %	5 %	5 %	GB 10-109; RDM 8-4
MIN.	0.3 %	0.3 %	0.3 %	GB 3-130
K VALUE				
SAG	96	136	136	GB 3-176, 3-37
CREST	84	151	151	GB 3-170, 3-35
HORIZ. ALIGN.				
MAX. SUPER.	8 %	8 %	8 %	RDM 1-15
MIN. RADIUS m or ft	758 ft	1200 ft	1200 ft	GB 3-45; RDM 8-3
SPIRAL (Y/N)	Yes	Yes	Yes	RDM 1-11
CROSS SLOPES				
PAVEMENT	2 %	2 %	2 %	RDM 1-3B
PAVED SHOULDER	2 %	2 %	2 %	STD. 560.02
TURF SHOULDER	4% (high)/8 % (low)	4% (high)/8 % (low)	4% (high)/8 % (low)	STD. 560.02
MEDIAN DITCH	N/A	N/A	N/A	
DITCH TYPICAL (A,B)	A	A	A	
CLEAR ZONE m or ft	30 ft	30 ft	30 ft	RDM 1-4N; RDG 3-3
TYPICAL SECTION NO.	6	6	9	

NOTES:

Design values were obtained from "The 2018 AASHTO A Policy on Geometric Design of Highways and Streets" (GB), the 2012 NCDOT Roadway Design Manual (RDM), and 2018 NCDOT Standard Drawings (STD).

Ramp designation is specific to ramp alignments originating and ending on a designated CD route or facility with a design speed of 60 MPH or less.

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ROUTE	PINEY PLAINS RD	DILLARD DR		REFERENCE
LINE	-Y4-	-Y3-		OR REMARKS
TRAFFIC DATA				
ADT 2018	10,000	10,000		NCDOT AADT Web Map
ADT DESIGN YR = 2045				
TTST				
DUALS				
D				
K				
CLASSIFICATION	Local	Local		NCDOT Func. Classification Map
TERRAIN TYPE	Rolling	Rolling		RDM 1-1D
DESIGN SPEED km/hr or mph	50 mph	50 mph		
POSTED SPEED km/hr or mph	45 mph	45 mph		Existing Condition
PROP. R/W WIDTH m or ft	Varies	Varies		
CONTROL OF ACCESS	No	No		
RUMBLE STRIPS (Y/N)	No	No		
TYPICAL SECTION TYPE	3/5 Lane, C&G	5 Lane, C&G		
LANE WIDTH m or ft	12 ft	12 ft		GB 5-16
SIDEWALKS (Y/N)	Yes	Yes		
BICYCLE LANES (Y/N)	No	No		
MEDIAN WIDTH m or ft	N/A	N/A		
MED. PROTECT. (GR/BARRIER)	N/A	N/A		
SHOULDER WIDTH (total)				
MEDIAN m or ft	N/A	N/A		
OUTSIDE w/o GR m or ft	10 ft berm	10 ft berm		RDM 1-7D, F-1; STD. 862.01
OUTSIDE w/ GR m or ft	14 ft berm	14 ft berm		RDM 1-7D, F-1; STD. 862.01
PAVED SHOULDER				
OUTSIDE TOTAL/FDPS m or ft	N/A	N/A		
MEDIAN TOTAL/FDPS m or ft	N/A	N/A		
GRADE				
MAX.	8 %	8 %		GB 5-4; RDM 1-14
MIN.	0.3 %	0.3 %		GB 3-130
K VALUE				
SAG	96	96		GB 3-176, 3-37
CREST	84	84		GB 3-170, 3-35
HORIZ. ALIGN.				
MAX. SUPER.	4 %	4 %		RDM 1-15
MIN. RADIUS m or ft	926 ft	926 ft		GB 3-42
SPIRAL (Y/N)	No	No		RDM 1-11
CROSS SLOPES				
PAVEMENT	2 %	2 %		GB 5-15, RDM 1-3B
PAVED SHOULDER	N/A	N/A		
TURF SHOULDER	N/A	N/A		
MEDIAN DITCH	N/A	N/A		
DITCH TYPICAL (A,B)	N/A	N/A		
CLEAR ZONE m or ft	28 ft	28 ft		RDM 1-4N; RDG 3-3
TYPICAL SECTION NO.	7, 8	8		

NOTES:

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SCALE:				
PLANS	1"=100'			
PROFILES	1"=100'	horiz.	1"=10'	vert.
INTERCH DETAIL	N/A			
CROSS-SECTIONS	N/A			
SHEET SIZE:				
PLANS				
INTERCH DETAIL	N/A			
CROSS-SECTIONS	N/A			
BRIDGES and/or CULVERTS:				
TYPE (SINGLE/DUAL/RCBC)				
SIZE (LENGTH x WIDTH x HT)				
LOCATION				
SKETCH #				
HORIZONTAL CLEARANCE	12'(median)/18' (outside)			
VERT. CLEARANCE	17.5'			

NOTES:

1- Within interchange slopes should not exceed 4:1