PROJECT 347 MA 184 F0476 01L NFA MARICOPA ROAD (SR 347) RIGGS ROAD TI ROADWAY CONSTRUCTION

AASHTO CONTROLLING DESIGN CRITERIA REPORT

September 2024

Prepared For:



ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION PROJECT MANAGEMENT GROUP

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LIST OF EXISTING FEATURES REQUIRING DESIGN EXCEPTIONS

The following is a list of the existing design features requiring design exceptions based upon A Policy on Geometric Design of Highways and Streets, 2018 edition.

SR 347 MAINLINE (DIVIDED)

No design exceptions.

RIGGS ROAD

No design exceptions.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA SR 347 MAINLINE SUMMARY (DIVIDED)

PROJECT NUM	MBER:		347 MA 184 F047	6 01L				ROUT	E: SR 347			
PROJECT LOC	CATION:		Riggs Road TI					BEGINNING M	P: 184.60			
HIGHWAY SEC	CTION:		Maricopa Road					ENDING M	P: 186.08			
FUNCTIONAL	CLASSIFICATION	4:	Rural Principal Art	terial								
TRAFFIC VOL	UMES AND FACT	ORS:										
						EXISTING	DESIGN	TRAI	FFIC FACTORS			
	SR 347 SEGME	NT				2022 AADT	2050 AADT	K=	D=	T=		
	NORTH OF RIG	GS ROAD (NO	RTH OF MP 185.29)			47,629	66,516	7%	73%	5%		
	SOUTH OF RIG	GS ROAD (SOL	JTH OF MP 185.29)			53,343	74,496	7%	63%	5%		
DESIGN SPEE	D:											
	THE A	ASHTO RECO	MMENDED MINIMUM	DESIGN SPEED	OF THE HIGHWAY IS:	50-75 MPH			THE POSTED S	PEED LIMIT IS	3: 65 MPH	
				AVE	RAGE ELEVATION IS:	1,140 FT				TERRAIN IS	: LEVEL	
LANE WIDTH.				NES								
			EXISTING	AASHTO								
	SR 347 NORTH		12'	12'								
SR 347 NORTHBOUND			12'	12'								
SHOULDER W	NDTH:											
			EXISTING	AASHTO	EXISTING	AASHTO						
	SR 347 NORTH	BOUND	4'	4'	10'	8'						
	SR 347 SOUTH	BOUND	4'	4'	10'	8'						
HORIZONTAL	CURVE RADIUS:											
			SUPERELEVATIO	N	EXISTING	AASHTO MAX	METHOD 2	POSTED	EXISTING	EXISTING	HORIZON	NTAL SSD
	MILEPOST	EXISTING	AASHTO MIN	RDG MAX	DEGREE OF	DEGREE OF	SPEED	SPEED	HSO	GRADE	EXISTING	REQUIRED
HPI STATION	BEGIN END) (FT/FT)	(FT/FT)	(FT/FT)	CURVE	CURVE	(MPH)	(MPH)	(FT)	(%)	(FT)	(FT)
					N/A - NO HORIZON	ITAL CURVES IN PRO	JECT LIMITS					
REMARKS:												

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA SR 347 MAINLINE SUMMARY (DIVIDED) (CONTINUED)

STOPPING SIGHT DISTANCE: VPI STATION MILEPOST BEGIN APPROACH END DEPARTURE GRADE (%) LENGTH OF GRADE (%) STOPPING SIGHT DISTANCE EXISTING EXISTING REQUIRED (FT) EXISTING (FT) SPEED (FT) SPEED SPEED SPEED SPEED SPEED SPEED SEE ATTACHMENT #1 MAXIMUM GRADE: SR 347 NORTHBOUND EXISTING MAXIMUM GRADE IS: 0.7140% 0.1000% -0.1000% -0.7140% AASHTO MAXIMUM GRADE IS: 3.0000% CROSS SLOPE: NORTHBOUND & SOUTHBOUND EXISTING CROSS SLOPE IS: 2.0% AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%	
VPI STATION MILEPOST BEGIN APPROACH END DEPARTURE GRADE (%) LENGTH OF GRADE (%) STOPPING SIGHT DISTANCE CURVE (FT) STOPPING SIGHT DISTANCE REQUIRED (FT) EXISTING REQUIRED (FT) EXISTING SPEED (FT) POSTED SPEED (MPH) SEE ATTACHMENT #1	
SEE ATTACHMENT #1 MAXIMUM GRADE: ASCENDING SR 347 NORTHBOUND EXISTING MAXIMUM GRADE IS: DESCENDING 0.7140% AASHTO MAXIMUM GRADE IS: 3.0000% CROSS SLOPE: NORTHBOUND & SOUTHBOUND EXISTING CROSS SLOPE IS: 2.0% AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%	
MAXIMUM GRADE: ASCENDING SR 347 NORTHBOUND EXISTING MAXIMUM GRADE IS: ASCENDING 0.7140% DESCENDING -0.1000% AASHTO MAXIMUM GRADE IS: 3.0000% CROSS SLOPE: NORTHBOUND & SOUTHBOUND EXISTING CROSS SLOPE IS: 2.0% AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%	
CROSS SLOPE: NORTHBOUND & SOUTHBOUND EXISTING CROSS SLOPE IS: 2.0% AASHTO ALLOWABLE RANGE IS: 1.5 - 2.0%	
VERTICAL CLEARANCE: VERTICAL VERTICAL CLEARANCE CLEARANCE MINIMUM STRUCTURE MILEPOST NB / EB SB / WB CLEARANCE	
N/A - NO EXISTING STRUCTURES IN PROJECT LIMITS	
DESIGN LOADING STRUCTURAL CAPACITY:	
STR. NO. BRIDGE VERTICAL BRIDGE BRIDGE ROUTE AND BRIDGE ROADWAY BRIDGE RAIL/ CLEARANCE LOAD SUFFICIENCY NO. MILEPOST NAME LENGTH WIDTH BARRIER AC OVERLAY (MINIMUM) RATING	

REMARKS:

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA RIGGS ROAD CROSSROAD

PROJECT NUMBER: PROJECT LOCATION: HIGHWAY SECTION: FUNCTIONAL CLASSIFICATION:	347 MA 184 F0476 011 Riggs Road TI Maricopa Road Rural Major Collector			ROUTE: INTERSECTION MP:	SR 347 185.29				
TRAFFIC VOLUMES AND FACTORS:									
			EXISTING	DESIGN	TRAFF	C FACTORS			
	IT		2022 AADT	2050 AADT	K=	D=	T=		
EAST OF SR 347			4,476	9,897 11,728	10%	64%	6%		
DESIGN SPEED:									
THE AASHTO RECO	MMENDED MINIMUM DESIGN SPEE A'	D OF THE HIGHWAY IS: VERAGE ELEVATION IS:	60 MPH 1,140 FT		THE POSTED SPI	ED LIMIT IS: TERRAIN IS:	55 MPH LEVEL		
LANE WIDTH:	LANES EXISTING AASHTO 12' 10'								
SHOULDER WIDTH: RIGGS RD:	<u>INSIDE SHOULDER</u> O EXISTING AASHTO EXI N/A N/A 12	DUTSIDE SHOULDER ISTING AASHTO 2' - 15' 6'							
HORIZONTAL CURVE RADIUS:									
MILEPOST HPI STATION BEGIN END	SUPERELEVATION EXISTING AASHTO MIN RDG (FT/FT) (FT/FT) (F	AASHTO MAX DEGREE OF CURVE	METHOD 2 SPEED (MPH)	POSTED SPEED (MPH)	EXISTING HSO (FT)	EXISTING GRADE (%)	HORIZON EXISTING (FT)	ITAL SSD REQUIRED (FT)	
		N/A - NO HORIZONT	TAL CURVES IN I	PROJECT LIMITS					
REMARKS:									

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA RIGGS ROAD CROSSROAD (CONTINUED)

SUPERELEVATION:		RIGGS	RD EXISTING M	AXIMUM RATE:	2.0%			AASHTO MAXI	MUM RATE IS:	12.0%		
STOPPING SIGHT DI	STANCE:											
VPI STATION	MILEPOST BEGIN	END	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FT)	STOPPING SIG EXISTING (FT)	GHT DISTANCE REQUIRED (FT)	EXISTING SPEED (MPH)	POSTED SPEED (MPH)			
MAXIMUM GRADE:		RIGGS R	D EXISTING MAX	XIMUM GRADE:	1.1000%			AASHTO MAXIM	UM GRADE IS:	6.0000%		
CROSS SLOPE:		RIGGS F	D EXISTING CR	OSS SLOPE IS:	2.0%			AASHTO ALLOWAE	BLE RANGE IS:	1.5% - 2.0%		
VERTICAL CLEARANCE:				VERT CLEAR			VERTICAL CLEARANCE	мілімим				
STRUCTU	STRUCTURE			NB /	'EB		SB / WB		CLEAF	RANCE		
				N/A -	NO EXISTING	STRUCTURES IN	PROJECT LIMITS	8				
DESIGN LOADING STRUCTURAL CAPACITY:												
	ROUTE NO. I	MILEPOST	STR. NO. AND NAME	BRIDGE LENGTH	BRIDGE ROADWAY WIDTH	BRIDGE RAIL/ BARRIER	AC OVERLAY	VERTICAL CLEARANCE (MINIMUM)	BRIDGE LOAD RATING	BRIDGE SUFFICIENCY RATING		
DEMARKS.				N/A -	NO EXISTING	STRUCTURES IN	PROJECT LIMITS	8				

ATTACHMENT 1 - VERTICAL CURVE INVENTORY

Project Name: SR 347/Riggs Road TI Project Number: 347 MA 184 F0476 01L Roadway Type: Rural Principal Arterial

VPI	MILE	POST	TRAFFIC	GRADE	GRADE	CURVE	CURVE	STOPPING SIGHT DISTANCE		SPEED	
STATION	BEGIN	END	DIRECTION	IN	OUT	LENGTH	TYPE	AVAILABLE	AASHTO	AVAILABLE	DESIGN
			(1w, 1a or 2)	(%)	(%)	(ft)		(ft)	MINIMUM (ft)	(mph)	(mph)
Exst SR 347 Med											
2578+00.			2	-0.1000	0.0000	0	GB	GB	GB	GB	70
2598+00.			2	0.0000	0.7140	800	Sag	+9999	737	+100	70
2606+00.			2	0.7140	-0.1000	800	Crest	1726	737	+100	70
2616+00.			2	-0.1000	0.0000	0	GB	GB	GB	GB	70
2650+00.			2	0.0000	-0.1000	0	GB	GB	GB	GB	70
2696+00.			2	-0.1000	0.2000	800	Sag	+9999	730	+100	70

Notes:

Traffic Direction:

1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.

* Indicates design exception required.

GB indicates grade break. Stopping Sight Distance and Speed not calculated. Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY

Project Name: SR 347/Riggs Road TI Project Number: 347 MA 184 F0476 01L Roadway Type: Rural Major Collector

VPI	MILE	POST	TRAFFIC	GRADE	GRADE	CURVE	CURVE	STOPPING SIGHT DISTANCE		SPEED	
STATION	BEGIN	END	DIRECTION	IN	OUT	LENGTH	TYPE	AVAILABLE	AASHTO	AVAILABLE	DESIGN
			(1w, 1a or 2)	(%)	(%)	(ft)		(ft)	MINIMUM (ft)	(mph)	(mph)
Exst Riggs Rd											
6+50.			2	0.1500	1.1000	200	Sag	+9999	657	+100	65
8+90.			2	1.1000	0.6300	100	Crest	2346	657	+100	65
9+64.43			2	0.6300	2.0000	0	GB	GB	GB	GB	65
SR 347 Intersection			2	2.0000	-2.0000	0	GB	GB	GB	GB	65
11+68.93			2	-2.0000	-0.9300	0	GB	GB	GB	GB	65
13+05.			2	-0.9300	0.1500	150	Sag	+9999	655	+100	65

Notes:

Traffic Direction:

1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.

* Indicates design exception required.

GB indicates grade break. Stopping Sight Distance and Speed not calculated. Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.