

Design Element				Manual Section	Design Criteria			
					Group 1	Group 2	Group 3	Group 4
Design Controls	Design Forecast Year (1)			14.2.1	20 Years	20 years	20 years	20 years
	Minimum Design Speed			14.2.2	(2)	20 mph	30 mph	35 mph
	Access Control			3.8	Controlled by Regulation			
	Level of Service			3.6.4	N/A	N/A	N/A	N/A
Cross Section Elements	Travel Lane Width			14.2.4	Min.: 9 ft	Des.: 10 ft Min.: 9 ft	Des.: 11 ft, Min.: 10 ft	11 ft
	Shoulder Width (3)	Total		14.2.4	4 ft	Des.: 6 ft	Min.: 4 ft	6 ft
		Paved			2 ft	2 ft	2 ft	2 ft
	Auxiliary Lanes	Lane Width		14.2.4	N/A	N/A	N/A	Min. 11 ft (4)
		Shoulder Width	Total		N/A	N/A	N/A	6 ft
			Paved		N/A	N/A	N/A	2 ft
	Cross Slope	Travel Lane		14.2.4	2.00%			
		Auxiliary Lane		14.2.4	N/A	N/A	N/A	2.00%
		Shoulder	Paved (5)	14.2.4	2.00%			
			Unpaved		8.00%			
	Bicycle	Bike Lane Width (6)		11.11	4 ft			
		Shared Roadway Width			N/A	N/A	N/A	14 ft Outside TL
	Sidewalk Width			7.3.3	5 ft			
	Median	Width (TWLTL)		7.4	N/A	N/A	N/A	15 ft
		Flush/TWLTL Slopes			N/A	N/A	N/A	2.00%
Right-of-Way Width			14.2.4	Project Specific				
Roadway Elements	Side Slopes	Cut Section	Foreslope	7.3.2	6H:1V to 4H:1V			
			Ditch Type		V-Ditch			
			Back Slope		2H:1V			
		Fill Section	0 ft – 5 ft		6H:1V			
			5 ft – 10 ft		4H:1V			
			> 10 ft		2H:1V			
	Clear Zone				(7)			

**GEOMETRIC DESIGN CRITERIA FOR LOCAL RURAL ROADS
(New Construction/Reconstruction)**

Figure 14.3-A

(Continued on next page)

Design Element			Manual Section	Rural	
Structures	New Bridges	Structural Capacity	7.5.1	HL-93	
		Clear Roadway Width	14.2.6	(8)	
	Existing Bridges to Remain in Place	Structural Capacity	14.2.6	(9)	
		Clear Roadway Width		(8)	
	Vertical Clearance (Local Road Under) (10a)	New and Replaced Overpassing Bridges (10b)	6.6	16 ft – 0 in	
		Existing Overpassing Bridges		14 ft – 0 in	
		Pedestrian Bridges		18 ft – 0 in	
		Overhead Signs		17 ft – 6 in	
		Overhead Utilities		Coordinate with Utilities Office	
	Vertical Clearance (Local Road Over)	Railroads	6.6	23 ft – 0 in	
		Underpass Width	7.5.2	Approach Roadway Width Including Sidewalks, where applicable	Traveled Way plus Clear Zone
	Vertical Clearance (Over Water)	Navigable Water	6.6	Coordinate with Environmental Services Office	
		Major Lakes & Reservoirs (with boat traffic)		8 ft – 0 in above the high water mark	
		Rivers		2 ft – 0 in above the design high water. Freeboard may be increased to a maximum of 7 ft – 0 in for large rivers.	
		Tidal Waters		2 ft above the 10-year high water elevation including wave height.	

**GEOMETRIC DESIGN CRITERIA FOR LOCAL RURAL ROADS
(New Construction/Reconstruction)**

Figure 14.3-A

(Continued on next page)

Footnotes for Figure 14.3-A

- (1) Design Forecast Year. Table values are desirable. For rural roads, the design year may be current traffic volumes.
- (2) Minimum Design Speed. Design speed is not a major factor for Group 1 roads and streets. Select a design speed based on available right of way, terrain, likely pedestrian presence, adjacent development and other area controls.
- (3) Shoulder Width. Shoulders should be increased by 3.5 feet where guardrail is used.
- (4) Auxiliary Lane Width. The auxiliary lane width should be the same as the adjacent travel lane.
- (5) Shoulder Cross Slope. For paved shoulders wider than 4 feet, use a 4.00 percent shoulder cross slope.
- (6) Bicycle Facilities Lane Width. If curb and gutter is provided, provide a 4-foot width from the face of curb. For design speeds greater than 45 miles per hour, increase the bike lane width in accordance with *AASHTO Guide for the Development of Bicycle Facilities*.
- (7) Clear Zones. See the *AASHTO Roadside Design Guide* for the applicable clear zones.
- (8) Bridge Widths. Bridge width is equal to the width of roadway section (outside shoulder to outside shoulder). See Section 7.5.1.1 for bridge widths.
- (9) Structural Capacity (Existing Bridges). Consult with the State Bridge Maintenance Engineer to determine the allowable structural capacity of bridges to remain in place.
- (10) Vertical Clearance (Local Roads Under).
 - a. Provide the vertical clearance over the entire traveled way, shoulders and any anticipated future widening.
 - b. Table value includes allowance for future overlays.

**GEOMETRIC DESIGN CRITERIA FOR LOCAL RURAL ROADS
(New Construction/Reconstruction)**

Figure 14.3-A
(Continued)

Design Element		Manual Section	Design Speed								
			20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
Stopping Sight Distance (1)		4.1	115 ft	155 ft	200 ft	250 ft	305 ft	360 ft	425 ft	495 ft	570 ft
Passing Sight Distance		4.2	400 ft	450 ft	500 ft	550 ft	600 ft	700 ft	800 ft	900 ft	1000
Decision Sight Distance (2)		4.3	-	-	220 ft	275 ft	330 ft	395 ft	465 ft	535 ft	610 ft
Intersection Sight Distance (3)		4.4	225 ft	280 ft	335 ft	390 ft	445 ft	500 ft	555 ft	610 ft	665 ft
Minimum Radii	$e_{\max} = 8\%$	5.2							758 ft	960 ft	1200
	$e_{\max} = 6\%$		81 ft	144 ft	231 ft	340 ft	485 ft	643 ft	833 ft		
Superelevation Rate (4)		5.3	6%	6%	6%	6%	6%	6%	6 / 8%	8%	8%
Horizontal Sight Line Offset (5)		5.4	20 ft	20 ft	21 ft	23 ft	24 ft	25 ft	27 ft 30 ft	32 ft	34 ft
Min. Vertical (K-values) (6)	Crest	6.5	7	12	19	29	44	61	84	114	151
	Sag		17	26	37	49	64	79	96	115	136
Maximum Grade	Level	6.3.1	8%	7%	7%	7%	7%	6%	6%	6%	5%
	Rolling		11%	11%	10%	10%	9%	8%	7%	7%	6%
	Mountain		16%	15%	14%	13%	12%	10%	10%	10%	n/a
Minimum Grade (7)		6.3.2	Des.: 0.5% Min.: 0.0%								

Footnotes

- (1) Stopping Sight Distance. Table values are for passenger cars on level grade.
- (2) Decision Sight Distance. Table values are for stop on a rural road, Avoidance Maneuver A. See Section 4.3 for other maneuvers.
- (3) Intersection Sight Distance. Table values are for passenger cars for assumed conditions described in Figure 4.4-C. See Section 4.4 for other conditions.
- (4) Superelevation Rate. See Section 5.3 for superelevation rates based on e_{\max} , design speed and radii of horizontal curves.
- (5) Horizontal Sight Line Offset. Table values provide the necessary middle ordinate assuming the design speed, stopping sight distance and minimum radii based on an $e_{\max} = 6$ percent for design speeds 20 to 50 miles per hour and $e_{\max} = 8$ percent for design speeds of 50 miles per hour or greater.
- (6) Vertical Curvature (K-Value). K-values are based on the level stopping sight distances.
- (7) Minimum Grade. The minimum grade of 0.0 percent can only be used on ditch sections where there is an adequate roadway cross slope and ditch grade. Ensure superelevation transitions are not developed in areas with 0.0 percent grade. Special ditch grades may be necessary to ensure proper project runoff management.

ALIGNMENT CRITERIA FOR LOCAL RURAL ROADS (New Construction/Reconstruction) Figure 14.3-B