

Design Element			Manual Section	2-Lane						
Design Controls	Design Year Traffic	AADT	40-2.01	< 50	50 ≤ AADT < 250	250 ≤ AADT < 400	400 ≤ AADT < 1500	1500 ≤ AADT < 2000	≥ 2000	
	Design Forecast Year		40-2.02	20 years						
	*Design Speed (km/h) (3)	Level	40-3.0	50 - 90	50 - 90	60 - 90	80 - 90	80 - 90	80 - 90	
		Rolling		50 - 90	50 - 90	50 - 90	60 - 90	60 - 90	60 - 90	
	Access Control		40-5.0	None						
Level of Service		40-2.0	Desirable: B; Minimum: D							
Cross Section Elements**	Travel Lane	*Width	45-1.01	3.0 m	3.0 m	3.0 m (4a)	3.3 m	3.3 m(4b)	3.6 m	
		Typical Surface Type	Ch. 52	Asphalt / Concrete / Aggregate						
	Shoulder	*Width Usable	45-1.02	0.6 m	0.6 m	0.6 m	1.8 m (5)	1.8 m	2.4 m	
		Typical Surface Type	Ch. 52	Asphalt / Aggregate / Earth						
	Cross Slope	*Travel Lane (6)	45-1.01	2%-3% Asphalt / Concrete; 6% Aggregate						
		Shoulder (6A)	45-1.02	Paved Width ≤ 1.2 m: 2% - 3%; Paved Width > 1.2 m: 4% - 6% Asphalt/Concrete; 6%-8% Aggregate; 8% Earth						
	Auxiliary Lanes	Lane Width	45-1.03	Same as Travel Lane			Des: Same as Travel Lane; Min: 3.0 m			
		Shoulder Width		Desirable: 1.2 m; Minimum: 0.6 m						
	Clear Zone		49-2.0	(7)						
	Side Slopes	Cut	Foreslope	45-3.0	4:1 (V > 60) (8); 3:1 (V # 60) (8)					
			Ditch Width		Des: 1.2 m; Min: 0.0 m					
Backslope			4:1 (V > 60); 3:1 (V # 60) (9)							
Fill		0-9 m Height	45-3.0	Desirable: 4:1; Maximum: 3:1						
	> 9 m Height	3:1								
Bridges**	New or Reconstructed Bridge	*Structural Capacity	Ch. 60	HS-25 (9a)						
		*Clear Roadway Width (10)	45-4.01	Travelway + 1.2 m			Travelway + 1.8 m		Full Paved Approach Width	
	Existing Bridge to Remain in Place	*Structural Capacity	Ch. 72	HS-10	HS-15					
		*Clear Roadway Width (11)	45-4.01	6.0 m	6.6 m	7.2 m	8.4 m			
	*Vertical Clearance (Local Road Under)	New or Replaced Overpassing Bridge (12)	44-4.0	4.45 m						
Existing Overpassing Bridge		4.30 m								
Vertical Clearance (Local Road Over Railroad) (13)		Ch. 69	7.00 m							

\*Controlling design criteria (see Section 40-8.0). \*\* Selection of the cross section and bridge elements is based on the design-year traffic volumes irrespective of the design speed. Des: Desirable. Min: Minimum.

## GEOMETRIC DESIGN CRITERIA FOR LOCAL RURAL ROAD <sup>(1)</sup> (New Construction or Reconstruction)

Table 53-5

Design Element		Manual Section	2-Lane							
Alignment Elements	Design Speed	---	30 km/h	40 km/h	50 km/h	60 km/h	70 km/h	80 km/h	90 km/h	
	*Stopping Sight Distance		42-1.0	35 m	50 m	65 m	85 m	105 m	130 m	160 m
	Decision Sight Distance	Speed / Path / Direction Chg.	42-2.0	90 m	120 m	145 m	170 m	200 m	230 m	270 m
		Stop Maneuver		40 m	50 m	70 m	95 m	115 m	140 m	170 m
	Passing Sight Distance		42-3.0	200 m	270 m	345 m	410 m	485 m	540 m	615 m
	Intersection Sight Distance		46-10.0	65 m	85 m	105 m	150 m	150 m	170 m	190 m
	*Minimum Radii (e=8%)		43-2.0	30 m	55 m	85 m	125 m	180 m	230 m	305 m
	*Superelevation Rate		43-3.0	e <sub>max</sub> =8% (14)						
	*Horizontal Sight Distance		43-4.0	(15)						
	*Vertical Curvature (K-values)	Crest	44-3.0	2	4	7	11	17	26	39
		Sag		6	9	13	18	23	30	38
	*Maximum Grade	Level	44-1.02	8%	7%	7%	7%	7%	6%	5.5%
Rolling		11%		11%	10%	9%	9%	8%	7%	
Minimum Grade		44-1.03	Desirable: 0.5%; Minimum: 0.0%							

\* Controlling design criteria (see Section 40-8.0).

These standards are to be used for each federal-aid funded project agency rural local road classified as new construction or reconstruction. Deviations from controlling Level One design criteria should be covered by a design exception approved by the Chief, Design Division.

**GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD<sup>(1)</sup>  
(New Construction or Reconstruction)**

**Table 53-5 (Continued)**

**GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD  
(New Construction or Reconstruction)**

**Footnotes to Table 53-5**

- (1) Applicability. This table is only applicable to a federal-aid project.
- (2) (Blank).
- (3) Design Speed. The minimum design speed should equal the minimum value from the table or the anticipated posted speed limit after construction, whichever is greater. The state legal limit is 55 mph on a non-posted highway.
- (4) Travel Lane Width. The following will apply:
  - a. Use 3.3 m lanes where  $V \geq 90$  km/h.
  - b. Use 3.6 m lanes where  $V \geq 90$  km/h.
- (5) Shoulder Width. The following will apply:
  - a. For  $400 \leq \text{AADT} < 1500$ , the shoulder width may be 1.2 m.
  - b. Usable shoulder width is defined as the distance from the edge of the travel lane to the shoulder break point.
- (6) Cross Slope (Travel Lanes). Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.
- (6A) Cross Slope (Shoulder). See Figure 45-1A(1) or Figure 45-1A(2) for more-specific information.
- (7) Clear Zone. The clear zone will vary according to design speed, traffic volumes, side slopes, and horizontal curvature. See Section 49-2.0. For a design speed lower than 80 km/h, a 3.0 m clear zone may be used.
- (8) Foreslope. See Sections 49-2.0 and 49-3.0 for the lateral extent of the foreslope in a ditch section.
- (9) Backslopes. Backslopes for a rock cut will vary according to geotechnical factors and the height of the cut.
- (9a) Structural Capacity (New or Reconstructed Bridge). A bridge with design year average daily truck traffic (ADTT) greater than 1,000 should be designed for HS 25 live loads. A bridge with an ADTT less than or equal to 1,000 may be designed for HS 25 or HS 20, whichever the LPA elects.
- (10) Width (New or Reconstructed Bridge). The width of each bridge of more than 30 m in length will be analyzed individually. At a minimum, the roadway width of such a bridge will be the width of travel lanes plus a 0.9-m right shoulder and 0.9-m left shoulder for a highway with AADT > 2000. Where shoulders are paved, it is desirable to provide the full approach roadway width. See Section 59-1.0 for more information on bridge width.
- (11) Width (Existing Bridge to Remain in Place). A minimum clear width that is 0.6 m narrower may be used on a road with few trucks. The clear roadway width should be at least the same width as the approach travelway. For a one-lane bridge, the width may be 5.4 m. For a bridge of more than 30 m in length, the values in the table do not apply. The acceptability of such a bridge will be assessed individually.

- (12) Vertical Clearance (Local Road Under). Table values include an additional 150 mm allowance for a future pavement overlay. Vertical clearances apply from usable edge to usable edge of shoulders.
- (13) Vertical Clearance (Local Road Over Railroad). See Chapter Sixty-nine for additional information on railroad clearance under a highway.
- (14) Superelevation Rate. See Section 43-3.0 for values of superelevation based on design speed and radii.
- (15) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius and the sight distance which applies at the site. See Section 43-4.0.