

Design Element			Manual Section	2 Lanes					
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 Period		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	Chp. 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	Chp. 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 Lane	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: 4 ft; Min: 0.0 ft						
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	Chp. 60	HL-93 (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	Chp. 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)		Chp. 69	7.00 m						

Des: Desirable. Min: Minimum.

* Controlling design criterion.

** Selection of the cross section and bridge elements is based on the design-year traffic volume irrespective of the design speed.

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

Figure 53-5

Design Element		Manual Section	2 Lanes							
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. Stop Maneuver	42-2.0	90 m	120 m	145 m	170 m	200 m	230 m	270 m
				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 Radius (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 _{max} =8% (14)							
	*Horizontal Sight Distance	43-4.0	(15)							
	*Vertical Curvature (K-value)	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 criterion. A deviation from such is a design exception, and is subject to approval. See Section 40-8.0.

A deviation from a controlling design criterion should be addressed in an approved design exception.

These criteria apply only to a federal-aid project.

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

Figure 53-5 (continued)

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

Footnotes to Figure 53-5

- (1) (Blank).
- (2) (Blank).
- (3) Design Speed. The minimum design speed should equal the minimum value or the anticipated posted speed limit after construction, whichever is greater. The legal speed limit is 55 mph (88 km/h) 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 volume, side slopes, and horizontal curvature. See Section 49-2.0. For a design speed of lower than 80 km/h, a 3-ft 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) Backslope. The backslopes for a rock cut will vary according to the height of the cut and the geotechnical requirements.
- (9A) Structural Capacity (New or Reconstructed Bridge). HS-25 loading with Alternate Military Loading should be applied for each project with notice to proceed with design beginning September 1, 2004, through December 31, 2005.

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

Footnotes to Figure 53-5 (continued)

- (10) Width (New or Reconstructed Bridge). A bridge longer than 30 m will be analyzed individually. At a minimum, the roadway width will be the width of travel lanes plus a 0.9 m right shoulder and a 0.9 m left shoulder for 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). Minimum roadway width of 0.6 m narrower than the value 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 longer than 30 m, the value does not apply. The acceptability of each such bridge will be assessed individually.
- (12) Vertical Clearance (Local Road Under). Value includes an additional 150-mm allowance for future pavement overlays. Vertical clearance applies 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 highway.
- (14) Superelevation Rate. See Section 43-3.0 for value of superelevation rate based on design speed and radius.
- (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.