

DESIGN LOADING: ALL NEW AND REHABILITATED BRIDGES SHALL BE DESIGNED FOR HS-20 LOADING.

FOR NEW ROUTE CONSTRUCTION OR ROUTE RECONSTRUCTION PROJECTS: THE MINIMUM CLEAR WIDTH FOR NEW BRIDGES SHALL BE EQUAL TO THE FULL WIDTH OF THE APPROACH ROADWAY (CURB-TO-CURB OR FULL SHOULDER WIDTH AS APPLICABLE).

TABLE I. MINIMUM CLEAR ROADWAY WIDTHS AND DESIGN LOADINGS FOR NEW AND RECONSTRUCTED BRIDGES (SEE PAGE 430)

DESIGN ADT (VEH/DAY)	DESIGN LOADING	MINIMUM CLEAR ROADWAY WIDTH OF BRIDGE (1)
UNDER 400	HS-20	TRAVELED WAY + 4 FT. (2 FT. EACH SIDE)
400 TO 1,500	HS-20	TRAVELED WAY + 6 FT. (3 FT. EACH SIDE)
1,500 TO 2,000	HS-20	TRAVELED WAY + 8 FT. (4 FT. EACH SIDE)
OVER 2,000	HS-20	APPROACH ROADWAY WIDTH

TABLE II. MINIMUM STRUCTURAL CAPACITIES AND MINIMUM ROADWAY WIDTHS FOR BRIDGES TO REMAIN IN PLACE (SEE PAGE 431) (2)

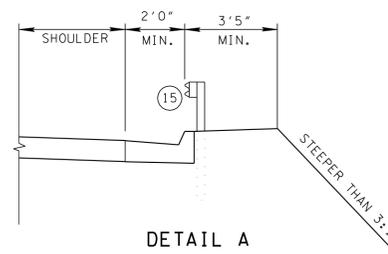
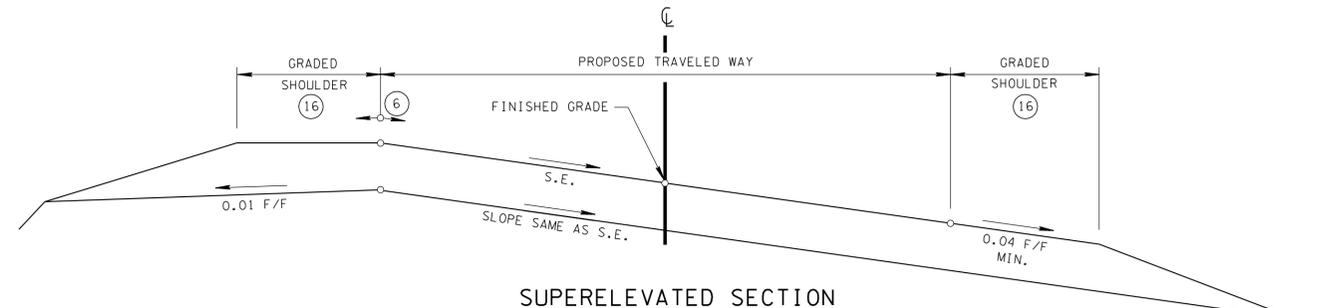
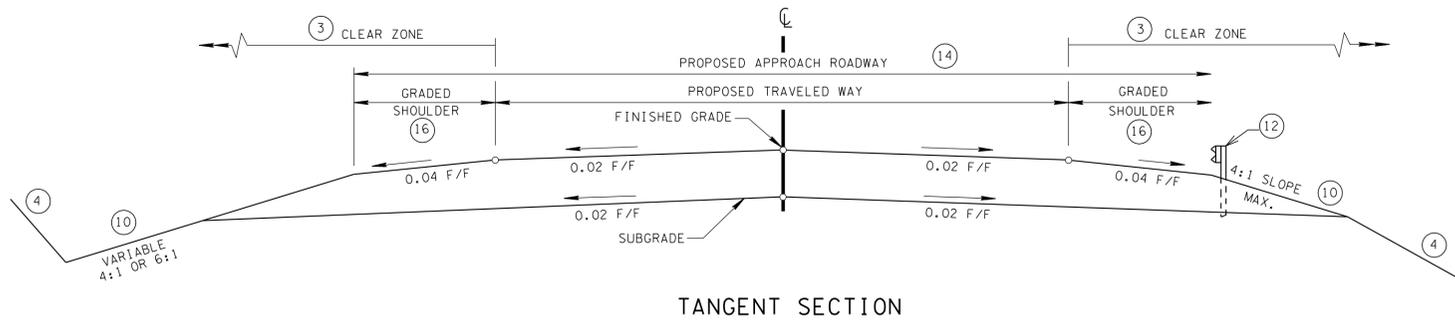
DESIGN ADT (VEH/DAY)	DESIGN LOADING (STRUCTURAL CAPACITY)	MINIMUM CLEAR ROADWAY WIDTH (FT.) (5)
UNDER 400	H-15	22
400 - 1,500	H-15	22
1,500 - 2,000	H-15	24
OVER 2,000	H-15	28

TABLE III. MINIMUM DESIGN SPEEDS FOR RURAL COLLECTOR ROADS (SEE PAGE 426)

TYPE OF TERRAIN	MINIMUM DESIGN SPEED (MPH) FOR SPECIFIED DESIGN ADT (VEH/DAY)		
	0-400	400-2,000	OVER 2,000
LEVEL	40	50	60
ROLLING	30	40	50
MOUNTAINOUS	20 (7)	30	40

TABLE IV. COLLECTOR ROADS AND STREETS - DESIGN STANDARDS (13)

DESIGN STANDARDS (FOR GIVEN DESIGN SPEED)	DESIGN SPEEDS (MPH)										MINIMUM WIDTH OF SHOULDERS FOR ALL SPEEDS (FEET) (SEE PAGE 429)
	20	25	30	35	40	45	50	55	60		
MINIMUM WIDTH OF TRAVELED WAY IN RURAL AREAS (FT.) (SEE PAGE 429) (8)	DESIGN ADT UNDER 400	20 (9)	20 (9)	20 (9)	20 (9)	20 (9)	20	20	22	22	4
	DESIGN ADT 400 - 1,500	22	22	22	22	22	22	22	22	22	4
	DESIGN ADT 1,500 - 2,000	22	22	22	22	22	22	22	24	24	6
	DESIGN ADT OVER 2,000	24	24	24	24	24	24	24	24	24	8
MINIMUM RADIUS (FT.) 0.04 MAX. S.E.	125	205	300	420	565	730	930	1190	1505		
MINIMUM RADIUS (FT.) 0.06 MAX. S.E.	115	185	275	380	510	660	835	1065	1340	SEE PAGE 145	
MINIMUM RADIUS (FT.) 0.08 MAX. S.E.	105	170	250	350	465	600	760	965	1205		
MAXIMUM RURAL GRADES % (11)	LEVEL TERRAIN	7	7	7	7	7	7	6	6	5	
	ROLLING TERRAIN	10	10	9	9	8	8	7	7	6	SEE PAGE 427
	MOUNTAINOUS TERRAIN	12	11	10	10	10	10	9	9	8	
MAXIMUM URBAN GRADES % (11)	LEVEL TERRAIN	9	9	9	9	9	8	7	7	6	
	ROLLING TERRAIN	12	12	11	10	10	9	8	8	7	SEE PAGE 436
	MOUNTAINOUS TERRAIN	14	13	12	12	12	11	10	10	9	
MINIMUM STOPPING SIGHT DISTANCE (FT.)	115	155	200	250	305	360	425	495	570		
MINIMUM "K" VALUE	CREST VERTICAL CURVE	7	12	19	29	44	61	84	114	151	SEE PAGE 426
	SAG VERTICAL CURVE	17	26	37	49	64	79	96	115	136	
MINIMUM PASSING SIGHT DISTANCE (FT.)	710	900	1090	1280	1470	1625	1835	1985	2135		
MINIMUM "K" VALUE FOR CREST VERTICAL CURVE	180	289	424	585	772	943	1203	1407	1628	SEE PAGE 427	
SUPERELEVATION	SEE STANDARD DRAWINGS RD01-SE-2 AND RD01-SE-3										



DETAIL A
GUARDRAIL PLACEMENT ON CURB AND GUTTER SECTION

FOOTNOTES

- (1) WHERE THE APPROACH ROADWAY WIDTH (TRAVELED WAY PLUS SHOULDERS) IS SURFACED, THAT SURFACE WIDTH SHOULD BE CARRIED ACROSS THE STRUCTURE.
- (2) THESE STRUCTURES SHOULD BE ANALYZED INDIVIDUALLY, TAKING INTO CONSIDERATION THE CLEAR WIDTH PROVIDED, TRAFFIC VOLUMES, REMAINING LIFE OF THE STRUCTURE, PEDESTRIAN VOLUMES, SNOW STORAGE, DESIGN SPEED, ACCIDENT RECORD, AND OTHER PERTINENT FACTORS.
- (3) THE CLEAR ZONE WIDTH SHALL BE DETERMINED FROM STANDARD DRAWING RD01-S-12. SEE THE "ROADSIDE DESIGN GUIDE," AASHTO, 2002 FOR FURTHER INFORMATION ON CLEAR ZONES.
- (4) SEE STANDARD DRAWINGS RD01-S-11 AND RD01-S-11B FOR DESIRABLE SLOPES AND NOTE REGARDING GEOLOGICAL RECOMMENDATIONS.
- (5) CLEAR WIDTH BETWEEN CURBS OR RAILS, WHICHEVER IS THE LESSER, SHOULD BE EQUAL TO OR GREATER THAN THE APPROACH TRAVELED WAY.
- (6) THE SLOPE OF THE SHOULDER AND THE ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 0.07 FOOT PER FOOT.
- (7) EFFORTS SHOULD BE MADE TO SELECT A DESIGN SPEED GREATER THAN 20 MILES PER HOUR. REFER TO PAGE 426 OF THE "POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," AASHTO, 2001, FOR FURTHER INFORMATION.
- (8) ON ROADWAYS TO BE RECONSTRUCTED, THE 22 FEET TRAVELED WAY MAY BE RETAINED WHERE THE ALIGNMENT AND SAFETY RECORDS ARE SATISFACTORY.
- (9) AN 18 FEET MINIMUM WIDTH MAY BE USED FOR ROADWAYS WITH DESIGN ADT UNDER 250 VEHICLES PER DAY.
- (10) DESIGN ADTS OVER 400 AND DESIGN SPEEDS OF 50 MILES PER HOUR AND GREATER SHALL REQUIRE 6:1 FORESLOPES, AND 3'-6" DEPTH DITCHES INSTEAD OF 2'-0" DITCHES.
- (11) SHORT LENGTHS OF GRADE IN RURAL AND URBAN AREAS, SUCH AS GRADES LESS THAN 500 FEET IN LENGTH, ONE-WAY DOWNGRADES, AND GRADES ON LOW-VOLUME RURAL OR URBAN COLLECTORS MAY BE UP TO 2 PERCENT STEEPER THAN THE GRADES SHOWN IN TABLE IV.
- (12) SEE DETAIL A FOR GUARDRAIL PLACEMENT AND GUARDRAIL STANDARD DRAWINGS (S-GR-SERIES).
- (13) ALTHOUGH THE SELECTED DESIGN SPEED ESTABLISHES THE LIMITING VALUES OF CURVE RADIUS AND MINIMUM SIGHT DISTANCE THAT SHOULD BE USED IN DESIGN, THERE SHOULD BE NO RESTRICTION ON THE USE OF FLATTER HORIZONTAL CURVES OR GREATER SIGHT DISTANCES WHERE SUCH IMPROVEMENTS CAN BE PROVIDED AS A PART OF AN ECONOMICAL DESIGN (SEE PAGE 69).
- (14) PROPOSED ROADWAY WIDTH WILL NOT BE LESS THAN EXISTING WIDTH.
- (15) WHEN GUARDRAIL IS PLACED BEHIND CURB AND GUTTER, THE SLOPING CURB HEIGHT MUST BE 4 INCHES OR LESS.
- (16) SHOULDER SURFACE TREATMENT TO BE SPECIFIED BY THE DESIGN DIVISION'S PAVEMENT DESIGN SECTION. DESIGNERS SHOULD REFER TO THE DESIGN GUIDELINES FOR PAVEMENT REQUEST PROCEDURES. WHEN SHOULDERS ARE PAVED AND GRADED SHOULDER WIDTH IS 6 FEET OR GREATER, THE SHOULDER SHOULD BE PAVED THE GRADED SHOULDER WIDTH MINUS TWO FEET. WHEN SHOULDERS ARE PAVED AND THE GRADED SHOULDER WIDTH IS LESS THAN 6 FEET, THE SHOULDER SHOULD BE PAVED THE WIDTH OF THE GRADED SHOULDER.

GENERAL NOTES

- (A) FOR SPECIFIC CONDITIONS NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," AASHTO, 2001.
- (B) PAGE NUMBERS REFERRED TO ON THIS DRAWING ARE FROM "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," AASHTO, 2001, UNLESS OTHERWISE NOTED.
- (C) REFERENCE SHOULD ALSO BE MADE TO THE "ROADSIDE DESIGN GUIDE," AASHTO, 2002.
- (D) FOR URBAN DESIGN GUIDANCE AND CRITERIA, SEE PAGES 433-444.
- (E) DESIRABLE RIGHT-OF-WAY IS SLOPE LINES PLUS FIFTEEN FEET.
- (F) FOR RURAL INTERSECTION DESIGN, SEE PAGE 432.
- (G) IF NO ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHALL BE TRAVELED WAY PLUS CLEAR ZONE.
- (H) IF ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHALL BE SUFFICIENT TO ACCOMMODATE THE UTILITIES OUTSIDE THE CLEAR ZONE.
- (I) FOR URBAN INTERSECTION DESIGN, SEE PAGE 442.