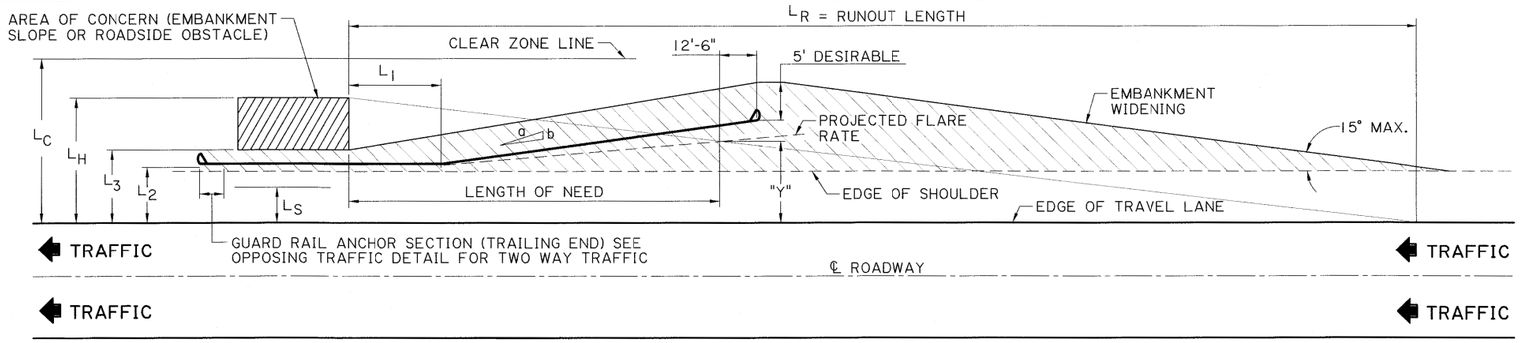
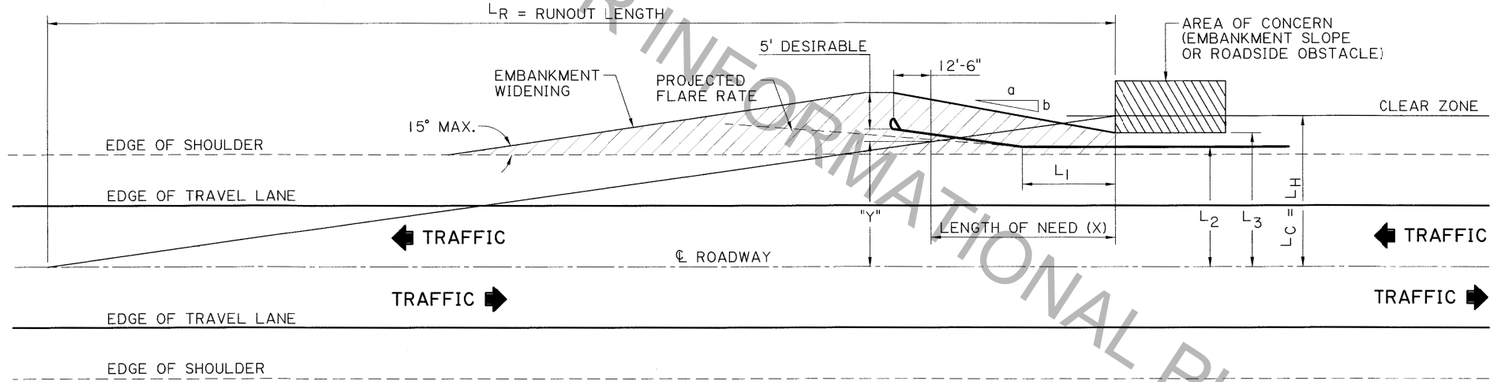


APPROACH TRAFFIC GUARD RAIL REQUIREMENTS-PLAN

N.T.S.



OPPOSING TRAFFIC GUARD RAIL REQUIREMENTS-PLAN

N.T.S.

NOTES:

1. ON TWO-WAY TRAFFIC "Y" IS MEASURED FROM THE CENTERLINE OF THE ROADWAY TO THE GUARD RAIL FOR THE OPPOSING TRAFFIC. THEREFORE, "Y" FOR GUARD RAIL ON THE LEFT SIDE OF A BRIDGE WITH TWO-WAY TRAFFIC IS MEASURED FROM THE CENTERLINE OF THE ROADWAY.
2. EQUATIONS FOR COMPUTING LENGTH OF NEED (X) AND OFFSETS (Y&Z). (ALL DIMENSIONS ARE IN FEET)

$$X = \frac{L_H + (\frac{b}{a})(L_1) - (L_2)}{(\frac{b}{a}) + (\frac{L_H}{L_R})} \qquad "Y" = L_H - (\frac{L_H}{L_R})(X)$$

$$"Z" = "Y" + \frac{b}{a}(12.5') + 9'$$

L_1 = LENGTH OF TANGENT SECTION OF RAIL IN ADVANCE OF HAZARD.

L_2 = DISTANCE FROM EDGE OF TRAVEL LANE TO TANGENT SECTION OF RAIL.

L_3 = DISTANCE FROM EDGE OF TRAVEL LANE TO OBSTACLE. IF $L_3 > L_C$ NO GUARD RAIL IS REQUIRED FOR ONCOMING TRAFFIC.

L_R = RUNOUT LENGTH

L_C = REQUIRED CLEAR ZONE (TABLE 1)

L_H = IS THE DISTANCE FROM THE EDGE OF THE TRAVELED WAY (EOP) TO THE LATERAL EXTENT OF THE HAZARD.

$L_H = L_C$ FOR BRIDGE APPLICATION, EXCEPT IN SPECIAL CASES SEE SHEET 1 OF 10 FOR DETAILS.

L_S = SHY LINE DISTANCE MEASURED FROM TRAVEL LANE.

⊞ 3. FLARE RATES SHOWN FOR BARRIERS INSIDE THE SHY LINE ARE DESIRABLE RATES AND MAY BE WAIVED IF THE GUARD RAIL LENGTH BECOMES TOO LONG FOR A GIVEN SITUATION.

⊕ 4. SEE SHEET NO. 5 OF 10 FOR FORMULAS FOR COMPUTING GUARD RAIL IN A CURVE.

5. FOR FURTHER INFORMATION CONCERNING TABLES 1-4, REFERENCE LATEST EDITION OF AASHTO ROADSIDE DESIGN GUIDE.

TABLE 1
CLEAR ZONE DISTANCE (Lc)
(IN FEET FROM EDGE OF TRAVELED LANE)

SPEED (MPH)	DESIGN ADT	⊗ FORESLOPE		⊗ BACKSLOPE		
		6H:1V OR FLATTER	5H:1V TO 4H:1V	3H:1V	4H:1V TO 5H:1V	6H:1V OR FLATTER
40 OR LESS	UNDER 750	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10
	750-1500	10 - 12	12 - 14	10 - 12	10 - 12	10 - 12
	1500-6000	12 - 14	14 - 16	12 - 14	12 - 14	12 - 14
	OVER 6000	14 - 16	16 - 18	14 - 16	14 - 16	14 - 16
45 TO 50	UNDER 750	10 - 12	12 - 14	8 - 10	8 - 10	10 - 12
	750-1500	14 - 16	16 - 20	10 - 12	12 - 14	14 - 16
	1500-6000	16 - 18	20 - 26	12 - 14	14 - 16	16 - 18
	OVER 6000	20 - 22	24 - 28	14 - 16	18 - 20	20 - 22
55	UNDER 750	12 - 14	14 - 18	8 - 10	10 - 12	10 - 12
	750-1500	16 - 18	20 - 24	10 - 12	14 - 16	16 - 18
	1500-6000	20 - 22	24 - 30	14 - 16	16 - 18	20 - 22
	OVER 6000	22 - 24	*26 - 32	16 - 18	20 - 22	22 - 24
60	UNDER 750	16 - 18	20 - 24	10 - 12	12 - 14	14 - 16
	750-1500	20 - 24	* 26 - 32	12 - 14	16 - 18	20 - 22
	1500-6000	26 - 30	*32 - 40	14 - 18	18 - 22	24 - 26
	OVER 6000	*30 - 32	*36 - 44	20 - 22	24 - 26	26 - 28
65 TO 70	UNDER 750	18 - 20	20 - 26	10 - 12	14 - 16	14 - 16
	750-1500	24 - 26	*28 - 36	12 - 16	18 - 20	20 - 22
	1500-6000	*28 - 32	*34 - 42	16 - 20	22 - 24	26 - 28
	OVER 6000	*30 - 34	*38 - 46	22 - 24	26 - 30	28 - 30

*WHERE A SITES SPECIFIC INVESTIGATION INDICATES A HIGH PROBABILITY OF CONTINUING ACCIDENTS OR SUCH OCCURRENCES ARE INDICATED BY ACCIDENT HISTORY, THE DESIGNER MAY PROVIDE CLEAR ZONE DISTANCES GREATER THAN SHOWN IN TABLE 1. CLEAR ZONES MAY BE LIMITED TO 30 FEET FOR PRACTICALITY AND TO PROVIDE A CONSISTENT ROADWAY TEMPLATE IF PREVIOUS EXPERIENCE WITH SIMILAR PROJECTS OR DESIGNS INDICATES SATISFACTORY PERFORMANCE.

⊗ BACKSLOPE MAY ALSO BE REFERRED TO AS A CUT SLOPE AND FORESLOPE AS A FILL SLOPE.

TABLE 3
L_R = RUNOUT LENGTH

DESIGN SPEED (MPH)	DESIGN TRAFFIC VOLUME (ADT)			
	OVER 10000 VPD	5000-10000 VPD	1000-5000 VPD	UNDER 1000 VPD
	RUNOUT LENGTH L_R (FT.)	RUNOUT LENGTH L_R (FT.)	RUNOUT LENGTH L_R (FT.)	RUNOUT LENGTH L_R (FT.)
70	360	330	290	250
60	300	250	210	200
50	230	190	160	150
40	160	130	110	100
30	110	90	80	70

TABLE 4
SHYLINE OFFSET & FLARE RATES

DESIGN SPEED (MPH)	L_S SHYLINE OFFSET (FT.)	⊞ MAXIMUM FLARE RATE (a:b) FOR BARRIER INSIDE SHYLINE	MAXIMUM FLARE RATE (a:b) FOR BARRIER BEYOND SHYLINE	
			⊠ RIGID BARRIERS	□ SEMI- RIGID BARRIERS
70	9	30:1	20:1	15:1
60	8	26:1	18:1	14:1
55	7	24:1	16:1	12:1
50	6.5	21:1	14:1	11:1
45	6	18:1	12:1	10:1
40	5	16:1	10:1	8:1
30	4	13:1	8:1	7:1

⊠ SUCH AS CONCRETE BARRIER UNITS
□ SUCH AS W BEAM OR THRIE BEAM GUARD RAIL SYSTEMS

TABLE 2
⊕ HORIZONTAL CURVE ADJUSTMENTS
$CZ_c = (L_c)(K_{cz})$

WHERE:
CZ_c = CLEAR ZONE ON OUTSIDE OF CURVATURE, FEET
L_c = CLEAR ZONE ON TANGENT SECTION, FEET (TABLE 1)
K_{cz}

K_{cz} = CURVE CORRECTION FACTOR

RADIUS (FT)	DESIGN SPEED (MPH)					
	40	45	50	55	65	70
2950	.1	.1	.1	.2	.2	.2
2300	.1	.1	.2	.2	.2	.3
1910	.1	.2	.2	.2	.3	.4
1640	.1	.2	.2	.3	.3	.4
1475	.2	.2	.3	.3	.4	.5
1315	.2	.2	.3	.3	.4	
1150	.2	.2	.3	.4	.5	
985	.2	.3	.4	.5	.5	
820	.3	.3	.4	.5		
660	.3	.4	.5			
495	.4	.5				
330	.5					

SHEET NUMBER		
PARISH	CONTROL SECTION	STATE PROJECT
DESIGNED P. FOSSIER CHECKED K. BRAUNER	DETAILED C. OWENS CHECKED P. FOSSIER	SERIES NUMBER MARCH 2015 2 OF 10

NO.	REVISION DESCRIPTION	BY	DATE
1	REVISED TABLES 1,2,3,4, SHY LINE NOTE	P.F.	7-13-2015
	DATE	APPROVED BY CHIEF ENGINEER:	
3-2-15		Jamie P. Williams	

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

HIGHWAY GUARD RAILS
GUARD RAIL TABLES AND LAYOUTS

GR-200

DOTD DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

BRIDGE & STRUCTURAL DESIGN