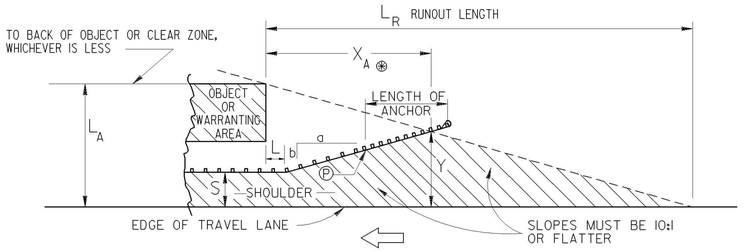
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	0012683	87	110

GUARDRAIL LENGTHS OF ADVANCEMENT AT FIXED OBJECTS OR AT WARRANTING FILL SLOPES TYPICAL

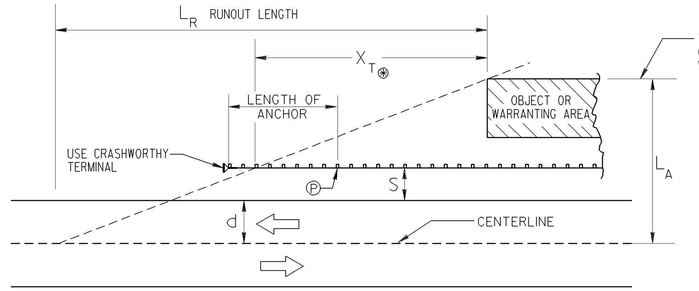
FLARED



$$X_A = \frac{L_A + (b/a)L - S}{b/a + (L_A/L_R)}$$

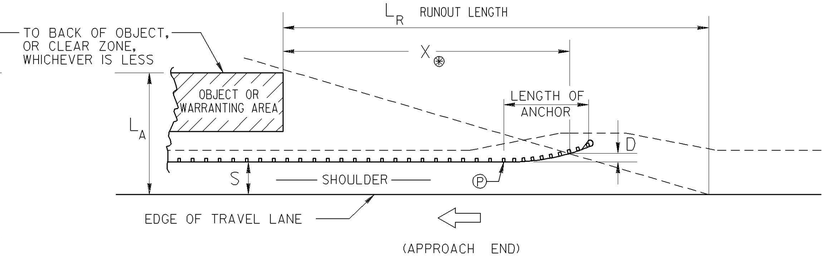
$$Y = L_A - \frac{L_A}{L_R}(X_A)$$

STANDARD



$$X_T = L_R \times \frac{L_A - (S+d)}{L_A}$$

(TRAILING END)

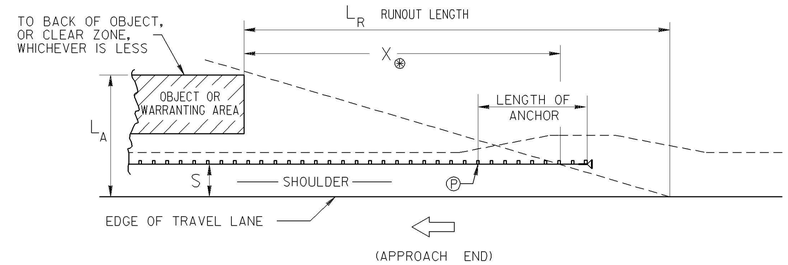


(APPROACH END)

$$X = L_R \times \frac{L_A - (S+D)}{L_A}$$

D = FLARE OF TERMINAL (OFFSET TO 3RD POST)

D = 0 FOR NON-FLARED TERMINALS



(APPROACH END)

DESIGN SPEED (MPH)	FLARE RATE a:b
70	15:1
60	14:1
55	12:1
50	11:1
45	10:1
40	8:1
30	7:1

DESIGN SPEED (MPH)	L_R Runout Length in feet			
	OVER 10000 (A.D.T.)	5000-10000 (A.D.T.)	1000-5000 (A.D.T.)	UNDER 1000 (A.D.T.)
80	470	430	380	330
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

S = USUABLE SHOULDER WIDTH PLUS 2 FT (TYP.)

Ⓟ = POINT OF BEGINNING TERMINAL (TYP.)

⊕ X_A, X_T, AND X MEASURED TO THE 3rd POST OF ANCHOR TYPICALLY SEE MANUFACTURE'S SPECIFICATIONS

CLEAR ZONE DISTANCES

CLEAR ZONE DISTANCES (FT) CHART

DESIGN SPEED	DESIGN ADT	FORESLOPES			BACKSLOPES		
		1V:6H OR FLATTER	1V:5H TO 1V:4H	1V:3H	1V:3H	1V:5H TO 1V:4H	1V:6H OR FLATTER
40 M.P.H. OR LESS	UNDER 750	7-10	7-10	* *	7-10	7-10	7-10
	750-1500	10-12	12-14	* *	12-14	12-14	12-14
	1500-6000	12-14	14-16	* *	14-16	14-16	14-16
	OVER 6000	14-16	16-18	* *	16-18	16-18	16-18
45-50 M.P.H.	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 M.P.H.	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 M.P.H.	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
65-70 M.P.H.	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

* WHEN A SITE-SPECIFIC INVESTIGATION INDICATES A HIGH PROBABILITY OF CONTINUING CRASHES OR WHEN SUCH OCCURRENCES ARE INDICATED BY CRASH HISTORY, THE DESIGNER MAY PROVIDE CLEAR-ZONE DISTANCES GREATER THAN THE CLEAR ZONE SHOWN ABOVE. CLEAR ZONES MAY BE LIMITED TO 30 FT. FOR PRACTICALITY AND TO PROVIDE A CONSISTENT ROADWAY TEMPLATE IF PREVIOUS EXPERIENCE WITH SIMILAR PROJECTS OR DESIGNS INDICATES SATISFACTORY PERFORMANCE.

* * BECAUSE RECOVERY IS LESS LIKELY ON THE UNSHIELDED, TRAVERSABLE 1V:3H FILL SLOPES, FIXED OBJECTS SHOULD NOT BE PRESENT IN THE VICINITY OF THE TOE OF THESE SLOPES. RECOVERY OF HIGH-SPEED VEHICLES THAT ENCROACH BEYOND THE EDGE OF THE SHOULDER MAY BE EXPECTED TO OCCUR BEYOND THE TOE OF SLOPE. DETERMINATION OF THE WIDTH OF THE RECOVERY AREA AT THE TOE OF SLOPE SHOULD CONSIDER RIGHT-OF-WAY AVAILABILITY, ENVIRONMENTAL CONCERNS, ECONOMIC FACTORS, SAFETY NEEDS, AND CRASH HISTORIES. ALSO, THE DISTANCE BETWEEN THE EDGE OF THE THROUGH TRAVELED LAND AND THE BEGINNING OF THE 1V:3H SLOPE SHOULD INFLUENCE THE RECOVERY AREA PROVIDED AT THE TOE OF SLOPE. A 10-FT RECOVERY AREA AT THE TOE OF SLOPE SHOULD BE PROVIDED FOR ALL TRAVERSABLE, NON RECOVERABLE FILL SLOPES.

HORIZONTAL CURVE ADJUSTMENTS

RADIUS (FEET)	K_{CZ} (CURVE CORRECTION FACTOR) DESIGN SPEED (MPH)					
	40	45	50	55	65	70
2950	1.1	1.1	1.1	1.2	1.2	1.2
2300	1.1	1.1	1.2	1.2	1.2	1.3
1970	1.1	1.2	1.2	1.2	1.3	1.4
1640	1.1	1.2	1.2	1.3	1.3	1.4
1475	1.2	1.2	1.3	1.3	1.4	1.5
1315	1.2	1.2	1.3	1.3	1.4	
1150	1.2	1.2	1.3	1.4	1.5	
985	1.2	1.3	1.4	1.5	1.5	
820	1.3	1.3	1.4	1.5		
660	1.3	1.4	1.5			
495	1.4	1.5				
330	1.5					

$CZ_C = (L_C)(K_{CZ})$

Where:

CZ_C = CLEAR ZONE ON OUTSIDE OF CURVATURE, FEET

L_C = CLEAR ZONES DISTANCE, FEET (SEE CHART AT LEFT)

K_{CZ} = CURVE CORRECTION FACTOR

NOTE:
THE CURVE CORRECTION FACTOR IS APPLIED TO THE OUTSIDE OF CURVES ONLY. CORRECTIONS ARE TYPICALLY MADE ONLY TO CURVES LESS THAN 2,950-FT RADIUS.

RELEASED FOR CONSTRUCTION
2-19-2016

BY	REVISION	DATE
B.J.Q.	REVISED TO 2011 RDG	4-16-15
G.L.O.	REMOVED SLOPE WARRENTS	9-4-07
	REVISED GUARDRAIL AND CLEAR ZONE	

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
GUARDRAIL WARRANT GUIDES
LENGTHS OF ADVANCEMENT
CLEAR ZONE DISTANCES
FILL HEIGHT EMBANKMENTS

NOT TO SCALE — DEC., 1999

DES. ____ (SUBMITTED) STATE DESIGN POLICY ENGINEER
DRW. ____
TRA. ____ (APPROVED) Margaret B Pirkle CHIEF ENGINEER
CHK. ____

NUMBER 4000W