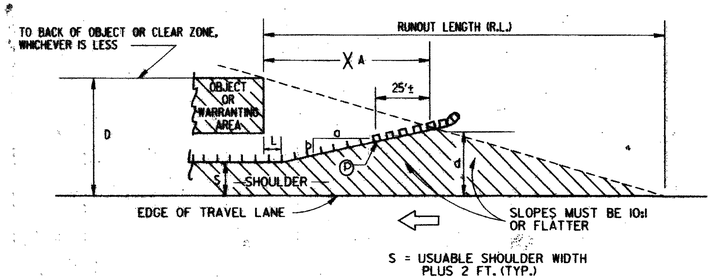
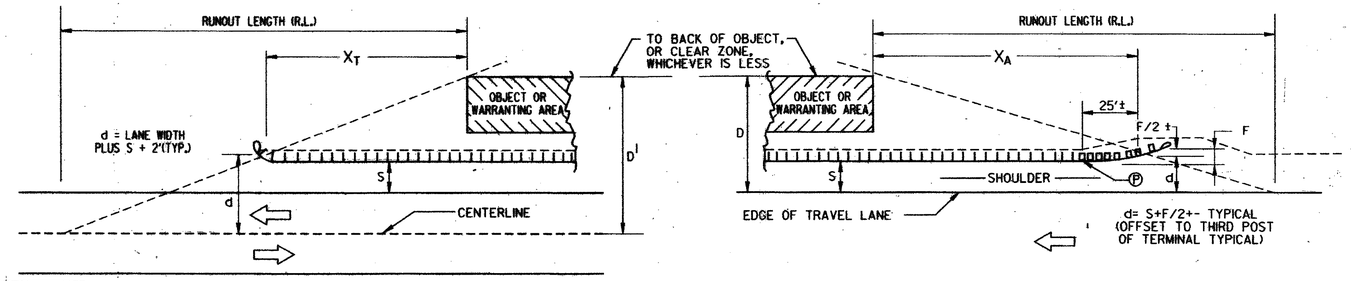
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	CSNHS-M002(070)	110	125

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

(FLARED)



(STANDARD)



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

$$d = D - \frac{D}{RL}(X_A)$$

DESIGN SPEED (MPH)	FLARE RATE a:b
70	15:1
60	13:1
50	11:1
40	9:1

DESIGN SPEED (MPH)	Runout Length (RL) in feet			
	OVER 6000 (A.D.T.)	2000-6000 (A.D.T.)	800-2000 (A.D.T.)	UNDER 800 (A.D.T.)
70	480	440	400	360
60	400	360	330	300
50	320	290	260	240
40	240	220	200	180
30	170	160	140	130

$$X_T = R.L. \times \frac{D^1 - d^1}{D^1}$$

(TRAILING END)

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

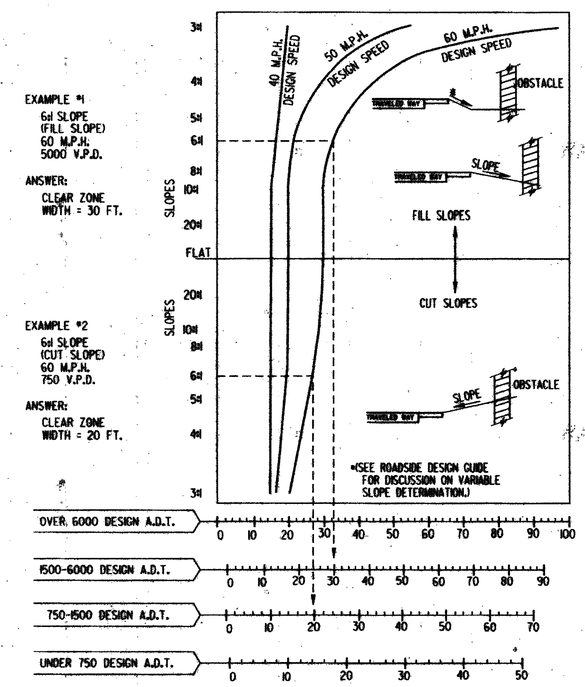
$$X_A = R.L. \times \frac{D-d}{D}$$

(APPROACH END)

F = FLARE OF TERMINAL (ZERO FOR NON-FLARED TERMINAL)

Ⓟ = POINT OF BEGINNING TERMINAL (TYP.)

CLEAR ZONE DISTANCES



CLEAR ZONE DISTANCES (FT) CHART

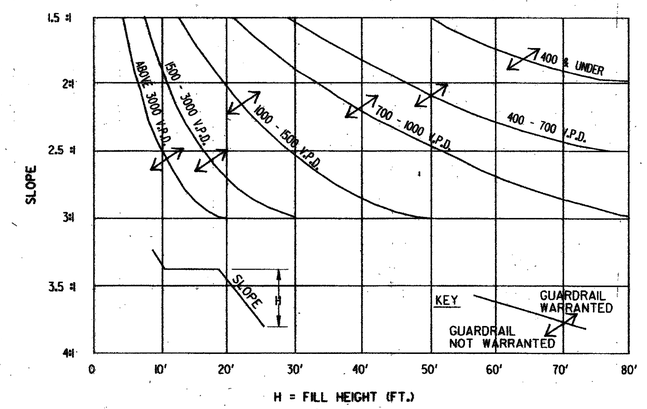
HORIZONTAL CURVE ADJUSTMENTS

DEGREE OF CURVE	K (CURVE CORRECTION FACTOR) DESIGN SPEED 40	45	50	55	60	65	70
2.0	1.08	1.10	1.12	1.15	1.19	1.22	1.27
2.5	1.10	1.12	1.15	1.19	1.23	1.28	1.33
3.0	1.11	1.15	1.18	1.23	1.28	1.33	1.40
3.5	1.13	1.17	1.22	1.26	1.32	1.39	1.46
4.0	1.15	1.19	1.25	1.30	1.37	1.44	
4.5	1.17	1.22	1.28	1.34	1.41	1.49	
5.0	1.19	1.24	1.31	1.37	1.46		
6.0	1.23	1.29	1.36	1.45	1.54		
7.0	1.26	1.34	1.42	1.52			
8.0	1.30	1.38	1.48				
9.0	1.34	1.43	1.53				
10.0	1.37	1.47					
15.0	1.54						

C.Z.C. = (K) (C.Z.W.)

Where: C.Z.C.= Clear zone on outside of curves 2 degrees or more.
C.Z.W.= Clear zone on tangents, curves less than 2 degrees and inside of any curve. (See chart at left)

FILL HEIGHT / SLOPE WARRANTS



NOTE:
FILL HEIGHT/SLOPE EXTRAPOLATIONS WHICH FALL ABOVE AND TO THE RIGHT OF CURVE INDICATES GUARDRAIL IS WARRANTED FOR THE FILL EMBANKMENT.

REVISION	BY	DATE

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. ____ DRW. ____ TRA. ____ CHK. ____

(SUBMITTED) STATE ROAD & AIRPORT DESIGN ENGR.

(APPROVED) CHIEF ENGINEER

NUMBER 4000W